

H. Carrington Bolton

A
COURSE
OF
Chymistry.

CONTAINING

The Easiest Manner of performing those
Operations that are in Use in *Physick*.

ILLUSTRATED

With many Curious Remarks, and Use-
ful Discourses upon each *Operation*.

TOGETHER

With Additional *Remarks* to the former *Opera-
tions*, the Process of the *Volatile salt of Tartar*,
and some other *Useful Preparations* by Way of

APPENDIX.

Writ in *FRENCH* by Monsieur
NICHOLAS LEMERT.

Translated by *WALTER HARRIS*,
Doctor of *PHYSICK*.

L O N D O N,

Printed for *Walter Kettilby* at the *Bishop's*
Head in *St. Paul's Church-Yard*, 1680.

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CONTAINING
 The Exact Manner of performing the
 Operations that are in Use in Physics.
 ILLUSTRATED

With many Curious Remarks and
 the Disposition of each Operation.
 RECEIVED

With Additional Remarks to the former Edition
 and the Notes of the Author's last Travels
 and some other useful Information by W. H.

APPENDIX

With an ACCOUNT of the
 HISTORY of the

ILLUSTRATED BY W. H. HARRIS
 DOCTOR OF PHYSIC

LONDON
 Printed by W. H. HARRIS at the
 Head in the Strand, 1680

W. J. W. Aug 29

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A
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cluded in the Art.

Mrs. H. C. Bolton

1912

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Translated by WALTER HARRIS,
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LONDON.

Printed for Walter Kettle at the Press
of St. Paul's Church Yard, 1775.



TO HIS
ROYAL HIGHNESS
JAMES
DUKE of YORK, &c.

May it please your Royal Highness,

THough I know how Pre-
sumptuous it is to Affix so
Great a Name to these inconsi-
derable Papers, yet the necessity
of a Patron both to Men and
Books, against the unavoidable

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Censures of busie Men, may perhaps help to excuse my Ambition, though exceeding its due measure: For no Man that's careful of Himself or Studies, being to seek a singular Patron, can ever more properly address Himself, than to a Person who is to his Power the Sanctuary of all Good Men, as well as the Terror of Others. Even those who are least sensible of Your Highness's Merit and Conduct, cannot but universally acknowledge how hard a thing it is to find so good a Master. For my part, if Comets should appear in every quarter of the Heavens,

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vens, if our Neighbours should grow ten times more Powerful than they are, if Heaven and Earth should conspire to terrifie us more ways than unquiet Spirits have of late endeavoured, I should rest Secure under the Shelter of Your Royal Highness's Protection, next to that of his Most Sacred Majestie's Prudence and Government. Other Princes may be proud to boast of some one good quality, but all the most Excellent Endowments that Humane Nature is capable of, are happily lodged in Your Great Soul. Your Piety to God, Exemplary Loyalty to his Majesty,

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Temperance and Sobriety in Converse, unshaken Constancy to your Friends, and Exact Justice and Goodness towards all Men, do shine so eminently, and are so undoubtedly acknowledged, that Your very Enemies, (if any such) would be confounded with shame upon their least reflection, and leave their Open Envy to become Your Secret Admirers. I shall only add, that God raises up Great and Virtuous Princes, to make a Nation happy by the Powerful Influence of Illustrious Examples. The World cannot be ignorant how infinitely it is obliged to Your Royal Highness

THE EPISTLE.

*ness in that respect, and the deep
sense of it has even inspired me
with this Ambition to testifie with
what Zeal I am,*

Your Royal Highness's

Most Humbly Devoted, and

most Obedient Servant,

WALTER HARRIS.

THE EPISTLE.

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THE
P R E F A C E.

READER,

BEfore you proceed, you must give me leave to pay my Ceremonies, and give you some account of this Undertaking. And first, I should be glad to convince you that neither of us lose our time, neither I in Publishing, nor you in Reading this Piece. For my part, my own Advantage was my principal motive. I had seen several Courses of Chymistry under this *Author*, while I lived with him in *Paris*, and I thought my self so much edified in his plain, easie, pertinent Lectures, that I long'd to see one Course more, and revive the old *Ideas*; and this I conceived could not be more effectually done, than by thus clothing it in *English*. Now to satisfy You,

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You, that you are not like to lose your time neither, I must be a little larger with you, and before I give you account of this Particular Chymistry, let us discourse a little freely of Chymistry in general, and of what use it may be in Physick.

As I shall not lead you back to the age of *Trismegistus*, nor conjure up the dormant Spirits of Antiquity; as I shall not derogate from the names of *Aristotle* and *Galen*, nor rake the pains of *Helmont* to traduce their Memories, and rake up their Ashes with a malicious Pen; so neither shall I make *Elogiums* on the daring attempts of those who oppose only Ignorance and Impudence against Learning and Modesty. The costive perverseness of some few old Dotards, who can hardly yet hear of *Chymistry* without being frightened, must be pitied, or laugh at; as well as the impossible pretences, the miraculous *Panaceas* of blustering Hectors, and Frontless *Empiricks*, be beat down and exploded.

Chymistry is of a nature so exalted, and so purified a being, that it bears some proportion to the Soul it self, and actuates
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inanimate things into different Motions, as the Soul doth the Body. And if there were not bounds to the knowledge of man, if Nature did not lock up her Treasures from the Curious, and discover her Secrets so seldom, what might we not expect as the result of this Art?

There's one thing discourages me from extending so freely as I might do in admiration of the Power of *Chymistry*, and that is the immodest pretences and boundless Panegyricks that Artists have been always apt to give their Remedies. But shall we cease from giving them their due, because Flatterers have given them too much? Sure we may weigh them if we please discreetly, without rejecting them as useless, or decrying them as more dangerous than they are. Let us indulge a little to the Adventurers of this Art, the raptures they enjoy at their own Discoveries. Those who take pains in earnest to find out a thing, must naturally be transported at the end of their Labors. Was he not a great Philosopher, and hath he not been the talk of the World, and even the quotation of School-boys ever since, who when after
much

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much cracking of his Brains he chanced to conclude and perfect a Demonstration, run about like a mad-man, crying out "Εὐρηκα" "Εὐρηκα". Suppose your self had stumbled at a Treasure, or chanced to trip upon a Golden Mine, d'ye think you should be still the same man you were before? I should be glad to see the man that were so real a Stoick as some have pretended to be.

There's one thing more staggers my good opinion at the men of Art, though not so much at the Art it self, and that is the affected Obscurity of former Writers. They must be rapt up in the clouds, walk in the dark, and play *Hocus Pocus*. You must be Apprentice to them seven years before you can be a Son of Art. Nothing forsooth must be rightly understood, but their Impossibilities, the Omnipotence of their Remedies.

But indeed if we consider the most unhappy state of Physick in these times, the fatal consequences that have ensued since Physicians have become Candid, Ingenuous, Open and Intelligible, 'twill make an honest heart to sigh, if not to bleed. Now every paltry Tradesman, though

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though he never had either Wit, proper Education, or any thing to set up this New Trade with, but a sufficient stock of Impudence; so soon as he hath by chance lighted upon, or once experimented some Physicians Receipt, he must presently leave his Calling, and fall to doing irreparable mischief to mankind by his Indiscreet, Immethodical, Universal application of his one single Remedy to all Constitutions, Ages, Sex, and Seasons, without Fear or Wit, or what is worse, without ever being scourged with the Magistrates Rods, or any way discouraged by Authority. What a miserable thing 'tis to see, and what contempt must it in time bring on the Ingenious, Noble Art of Physick, that one can't now pass the Streets, or follow ones business to *Westminster* without being assaulted with swarms of the most ridiculous Bills, and mischievous Papers that ever yet appeared in any Nation under the Sun?

'Tis a strange thing to see the difference there is between the True Art of Physick, and the art of Quacking, how differently it inspires men. The former renders

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renders men cautious, circumspect, advised, and apt to weigh every contingent in the balance of Deliberation, more nicely than *Apothecaries* do the Grains they dispense; the latter makes them heady, presumptuous, fear nothing, adventure on any thing.

But it is time to return to our more immediate purpose, and that we may have the right understanding of the true Use of *Chymistry*, it will be requisite to divide Diseases into Chronical and Acute.

As for Chronical, they generally proceed from Obstructions either in the Head, or the *Viscera*. Now can any man persuade himself that *Galenical Remedies*, whose action is hindered by their *Fæces*, and clog'd with dull earthy mixtures, should be capable of dissolving the obstructing matter, and driving the humours out of their Melancholick Stagnations into their former Channels, so well as Chymical Preparations, which being devested of all manner of hindrance, do search narrowly into every part, and if conducted with a Sound Judgment, not Empirical
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Rashness, must needs produce incomparable effects? The difference is much the same as between a naked Sword, and a Sword in its scabbard; he that would endeavour to destroy a powerful enemy with this last, when he had time and warning to draw his Sword, deserves to be pitied for Fool or Mad. Diseases are our declared enemies, and we must provide our selves of good offensive weapons, if we intend to destroy them, or secure our selves from the attacques of relapses.

As for Acute Diseases, I am apt to conceive that a sober and moderate following of true well-weighed Indications, by easie and innocent Remedies would prove much more effectual than the common way of Ostentation of Learning, and too frequent supply of Elaborate Mixtures, which will very well serve to amuse, but I fear, prove far from benefiting the Patient. 'Tis true, men are themselves the cause of this unhappy dealing. They think the Physician hath not taken pains enough to deserve his Fee, unless he writes something for it. And when he's once a writing, 'tis ten to one but he exercises his Wit as well as Pen, and both

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Complements, and Puzzles the *Apothecary*. Whereas if Nature were waited upon with care and circumspection, her Symptomatical Motions diligently observed, and she gently assisted in doing her best, there is reason to hope she would give a much better account of her endeavours, as well as her servant the Physician of his.

How happy therefore is our Nation, that so abounds in Solid Physicians, ev'ry way most skilful! how happy is this City in so Learned a Colledge, and Judicious Race of men, that never could any part of the World boast the like! Here you may meet with the Truest, most substantial Learning, that ever any Profession could yet attain to. They do not busie themselves in Notional, Idle Speculations, but the most Solid, Useful part of things. They do not only steer themselves by sound *Galenic* Principles, but are Inquisitive and Knowing in the best Chymical Remedies that can be prepared. In a word, among that incomparable Society may you easily meet with the choicest Sons of *Hermes*, as well as the wisest Heirs of

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of the Great *Hippocrates*. Dr. *Rugely*, Dr. *Dickinson*, Dr. *Goodall*, may, if you please, deservedly speak for the rest; for if I should go to reckon up all the Honourable Members of this Colledge, that are excellent in this Art, I might perhaps trouble you with Transcribing the whole Catalogue. For 'tis not want of Method that makes a man a Chymist, as some illiterate men would have it, it is by the prudent means of Method that *Chymistry* will grow into its due request, and by the discreet conduct of those Active Medicines, all ignorant people will be able to distinguish between a true Chymical Doctor, and an Empirick.

Nevertheless, as I would not expect Chimerical effects from Chymical Remedies, as I cannot think an Almighty Power bestowed on Second Causes, so neither can I without pity consider the unhappy diligence of some Learned men to invalidate all the industrious acquisitions of private persons, or to pretend that nothing can be good for any thing that continues an *Arcanum*, or is esteemed a *Specifick*. Sure *Physick* is the most unhappy of all Arts

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and Sciences, if it can proceed upon no more certain *Basis* than ambiguous Conjectures. And God knows that Practice which is rather grounded on Learned Conceptions, than Physical Observations of the effects of things, though it may talk well for it self, and charm the world with a very pretty appearance, yet it will soon be found to be built on Sand, or Scholastical Cobwebs. What ! sure *Riverius's Febrifugum* signified something, and happy was he that fell into the reach of so powerful a Medicine, after he had been racked with repeated Paroxysms, or tormented with the Learned but fruitless endeavors of other Physicians. Certainly *Physick* is but at an ill pass, and the study of it the most uncomfortable thing in nature, if no *Specificks* can be known, no Symptoms encountered with proper effectual Remedies. Beasts can apply themselves to the *Specifick* Herb by a harmless instinct, and poor Man with all his Reason must be left desolate.

Pardon me, *Good Reader*, if I take a greater liberty on this subject than some will perhaps allow me. As I should gladly learn your thoughts another time on this matter, give me leave to speak
now

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now a little freely. I cannot possibly imagine, what should hinder all this while those Improvements in Physick, which all other Arts have sufficiently received, unless it be the want of that *Extraordinary Charity*, and freedom from *Avarice*, which seems to me to be requisite for the *successful* discharging so *serious* an Employment. *Hippocrates* was an honest and a good man, he had a real Zeal for the good of his Countrey, and preservation of a good Conscience; he never made Money the least Motive of his Cures, but did all with a Charity that I never expect to see Christianity arrive to. The Devil is too busie with us to let us come up to the Morality of those Heathens, whose Works will shame and confound one day our Religious Pretences. Well, but you see what was the effect of *Hippocrates* his *Extraordinary Integrity*, God blest him with an Oracular knowledge, he was esteemed the Father of his Countrey, and really was so; the certainty of his Prognosticks made him almost Adored. He was sent to by the greatest Monarchs, and courted on every side, and yet he

*Vid Hippocr.
Epist. ad Ab-
derit.*

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chose rather to serve the place he was born to serve, than to comply with the deceitful baits we are all so unhappily caught with, and the most Luxurious profers of those who did not deserve him. O that I could but once see some Noble Generous mind, endowed with an ample fortune, put on the same temper, not pretend to Cure the Poor for nothing, in order to fleecing the Rich, but heartily going about doing good rather to others than himself. Then should you see *Hippocrates* his Wisdom revive again, and Physick would soon be another thing than it is now. We might then hope for a better understanding in *Specificks* than Brutes have, and the loss of *Solomon* might be once more recovered. 'Tis strange that Christian Motives, Eternal Rewards, and the wonderful condescension of Gods own Example and Life among us, should not be able to work upon our stiff natures as much, as Natural Reason, and the confused prospect *Hippocrates* had of t'other world was able to effect. But alas, instead of that largeness of Soul which is requisite to contain so admirable a Temper, we must

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must be a Censuring and snarling at one another, scrambling for pelf, and eagerly pursuing oblique designs to the general good of mankind. As for the Health and Happiness of those we converse with, their precious Lives and Safeties, I wish there may be none *who cast Firebrands about, and say Am I not in sport.*

These considerations make me indeed despair of seeing the effects of *Physick* as certain as I could wish. The Sins of Men loudly forbid so great a Blessing, and the ordinary designs of Providence do so constantly mix Bitter with Sweet, and so allay the Pleasures of this Life, that we must not easily expect a sure period to Infirmities and Miseries. If we could return to our Native Innocence, and retrieve the Paradise of a guiltless mind, we might perhaps quickly return to the ancient soundness of Body, and in some measure answer the age of *Methuselah*.

But seeing that is so difficult a task, and an universal Change so impossible a thing, we must live as contented with our unhappiness as we can. For though *Chymistry* may fairly pretend to do stran-

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ger things than have been yet done, nevertheless Miracles must not be expected from it. 'Tis that which unfolds the Mysteries of Nature as far as they can be known, and views her thoroughly in her naked dress.

Therefore those who desire a competent knowledge in this Useful Art, will I hope find sufficient satisfaction in this *Treatise*. Such as have a mind to tread unknown paths in the Mineral Kingdom, who swell with expectation to make themselves Rich on a sudden, and extravagantly spend undoubted Treasure in searching after Wealth, within the walls of Aerial Castles, must seek for instructions somewhere else. This is not *Chymistry* for them. The *Author* is a man of a searching wit, and an indefatigable Industry. He's neither affected nor obscure in his Expressions, but as easie and intelligible all along as good Breeding teaches a man to speak. He is not singular in many of his Operations, but made Truth and Experience the *Basis* of his Design, rather than pretty self-conceited Inventions. He hath illustrated his Operations with Curious
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Remarks of his own, and many Natural Pertinent Consequences from the precedent Process.

And for your greater ease, that you may lose no time in Thumbing over leaves you are little concerned to turn, I have given you a short prospect of the more Remarkable Curiosities of this Book, by adding a summary Collection of them, by which, if I have saved you some pains that is often thrown away in seeking after precious things where they are not to be found, I shall receive some pleasure by being any way instrumental to serve you.

The Approbation of the Faculty of
Phyſick in Paris.

WE the Preſident and Doctors of the Faculty of *Phyſick* in the University of *Paris*, after having heard the relation of Monsieur *Antony Morand*, *John-Baptiſta Moreau*, & *John-Armand de Mauvillain*, Doctors of the ſame Faculty, deputed for the Examination of a Book preſented to the ſaid Faculty, Intituled, *A Course of Chymiſtry, containing the eaſieſt manner of performing thoſe Operations that are in uſe in Phyſick, with Remarks upon each Operation; compoſed by Monsieur Nicholas Lemery*, which he ſubmitted to the Judgment of the ſaid Faculty, according to the Rules and Decrees of *Parliament*, and particularly that of the Eighth of *July*, 1673, in relation to the Printing of Books, Do Approve the Printing of the ſaid Book, in which we have found many things that are Curious: in teſtimony of which, we have ſigned this preſent Approbation. At *Paris* this thirteenth of *February*, 1675.

Morand.

A. J. Morand, Preſident.

Moreau.

Mauvillain.



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Licensed,

Roger L'Estrange.



A
C O U R S E
O F
C H Y M I S T R Y.

Of Chymistry in General.



Chymistry is an Art that teaches how to separate the different substances which are found in Mixt Bodies: I mean by a Mixt Body those things that naturally grow and encrease, such as Minerals, Vegetables, and Animals. Under the name of Minerals, I comprehend the Seven Metals, Minerals, Stones, and Earths; under Vegetables, I understand Plants, Gumms, Rosins, Fruits, the several sorts of Fungus, Seeds, Juices, Flowers, Mosses, and whatsoever else comes from them. Among these also I reckon Manna, Honey, and those that are called imperfect Mixts. And under Animals I contain both the Animals themselves, and whatso-

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ever belongs to them, as their parts and excrements. But before I begin to speak particularly of all these things, I believe it will be convenient to say something of the Principles of Chymistry, and give a general *Idea* of Furnaces, Lutes, the degrees of Fire, and Terms that may occasion any obscurity.

Of the Principles of Chymistry.

The First Principle that can be admitted for the composition of Mixts, is an Universal Spirit, which being diffused over all the World, produces different things according to the different Matrixes, or Pores of the Earth in which it settles. But because this Principle is a little Metaphysical, and falls not under our senses, it will be fit to establish some sensible ones; wherefore I shall relate those that are commonly used.

Whereas the Chymists in making the Analysis of Mixt Bodys have met with five sorts of Substances, they therefore concluded that there were five Principles of Natural things, Water, Spirit, Oil, Salt, and Earth. Of these Five, Three of them are Active, the Spirit, Oil, and Salt, and two passive, Water and Earth. They called them Active, by reason they do cause all manner of Action; and the others Passive, because being in repose they only serve to stop and hinder the quick motion of the Actives.

The Spirit which is called Mercury is the first of the Active Principles, that appears to us, when

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when we make the Anatomy of a Mixt Body. 'Tis a subtile, piercing, light substance, that is more in motion than either of the others. It is this which causes all Bodys to grow in more or less time, according as it abounds in them more or less. But it happens that the Bodys wherein it abounds are more liable to Corruption, by reason of its too great and unquiet motion, and this is observ'd in Animals and Vegetables. On the contrary the greatest part of Minerals, as containing but a very small quantity of it, do seem to be incorruptible. It cannot be drawn pure, no more than the others I am going to speak of. But either it is involv'd in a little Oil, that it carries along with it, and then may be called a Volatile Spirit, such as the Spirit of Wine, of Roses, of Rosemary, of Juniper; or else is detained by some Salts, which check its Volatility, and then may be called a fixt Spirit, as the Acid Spirits of Vitriol, Alum, Salt, &c.

The Oil which is called Sulphur by reason of its inflammability, is a sweet, subtile, unctuous substance, that comes out after the Spirit. This is said to cause the diversity of Colours and Smells, according to its disposition in Bodys: this gives them their Beauty, and Deformity, uniting together the other Principles: this also sweetens the acrimony of Salts, and by shutting up the pores of a Mixt, hinders it from corrupting, either by too much moisture or cold. Wherefore many Trees and Plants that have a great deal of Oil, are wont to last green much longer than others, nay and can resist the extre-

mity of ill Weather. It is always drawn impure. For either it is mixt with Spirits, as the Oyles of Rosemary, of Lavender, which swim above the Water; or else it is fill'd with Salts, that it draws along with it in the Distillation, as the Oyl of Box, Guaiac, Cloves, which do precipitate to the bottom of the Water by reason of their weight.

Salt is the last of the Active Principles, which remains disguised in the Earth, after the other Principles are extracted. It is drawn by pouring Water upon the Earth to imbibe its Salt; then filtering the dissolution, and evaporating all the moisture, a Salt is found at the bottom of the Vessel. It is a fixt, incombustible substance, that gives Bodies their consistence, and preserves them from corruption. This causes the diversity of tastes, according as it is diversly mixed.

There are three differences of Salt, as Fixt, Volatile, and Essential. The Fixt Salt is that which remains, after the Volatile Principles are separated: The Volatil is that which easily riseth, as the Salt of Animals: And Essential Salt is that which is obtained from the Juyce of Plants by CrySTALLIZATION. This last is between the Fixt and Volatil.

Water, which is called Phlegm, is the first of the Passive Principles; it comes in distillation before the Spirits when they are Fixt, or after them when they are Volatil. It is never drawn pure, but always receives some impression from the Active Principles. And this causes it to have a more deterfive virtue in it than common Water.

ter. It serves to separate the Active Principles, and to bridle their motion.

The Earth, which is called *Caput Mortuum*, or *Terra Damnata*, is the last of Passive Principles, and can no more be separated pure than the rest, but will still retain some Spirits in it; and if after you have depriv'd it of them as much as you are able, you leave it a good while exposed to the Air, it will recover new Spirits again.

Remarks upon the Principles.

The five principles are easily found in Animals and Vegetables, but not so easily in Minerals. Nay there are some Minerals, out of which you cannot possibly draw so much as two, nor make any separation at all (as Gold and Silver) whatsoever they talk, who search with so much pains for the Salts, Sulphurs and Mercuries of these Metals. I can believe, that all the Principles do indeed enter into the composition of these Bodies, but it does not follow that they must remain in their former condition, or can be drawn as they were before; for it may be these substances which are called Principles are so strictly involved one within another, as to suffer no separation any other way than by breaking their Figure. Now it is by reason of their Figure that they are called Salts, Sulphurs, and Spirits: For example, if you mix an Acid Spirit with the Salt of Tartar, or some other Alkali, the edges of the Acid

will so insinuate into the Pores of the Salt, that if by distillation you would separate the Acid Spirit again from the Salt, you'l never be able to effect it, because the edges of these Spirits are so far destroyed or changed, that they no longer preserve their former Figure.

Every body knows that Glafs is made of Salt, but because the Fire hath wrought so great a change upon its Texture, or Figure, it can do nothing at all that Salt is used to do; nay, and it is in a manner impossible to draw any true Salt from it by Chymistry.

There are three sorts of Liquors that are qualified with the name of Spirit in Chymistry; the Spirit of Animals, the Burning spirit of Vegetables, and the Acid spirit.

The first of them, as the spirit of Harts-horn, is nothing but a Volatile salt dissolved by a little Phlegm, as I shall shew when I treat of Animals. The second, as the spirit of Wine, the spirit of Juniper, and the spirit of Rosemary is an exalted Oyl, as I shall shew speaking of Wines. And the last, as the spirit of Vinegar, Tartar, and Vitriol is an Acid Essential salt, dissolved and put in fusion by the fire, as I shall prove, when I speak of Vinegar, and the Distillation of Tartar.

Many things are called Oyls very improperly, as the Oyl of Tartar made *per Deliquium*, and the Oyl of Vitriol: The first is nothing else but a Salt dissolved, and the second is the strongest, and most caustick part of the spirit of Vitriol.

As for Salt, I am apt to think, that there is one chief, of which all the rest are compounded,
and

and do conceive it to be made of an Acid Liquor sliding through the veins of the Earth, which doth insensibly insinuate and incorporate in the Pores of stones: afterwards by a long fermentation and concoction of several years, a Salt comes to be formed, that is called Fossile; and this Opinion is the more likely to be true, because from the mixture of Acids with some Alkali matter we always draw a substance very like unto Salt. Now stones are an Alkali. I add, that the long fermentation, and concoction which is made in the stone, serves to digest, and perfectly unite the Acid with the stony parts, for the making of Salt.

This Fossile salt, which is called Gemma, by reason of its transparency, is found in many high Mountains of *Europe*, such as those in *Poland*; it is altogether like that we use for nourishment, which is called Sea-salt, insomuch that the Waters of the Sea may be said to receive their saltiness from nothing else but this Salt dissolved in them. Some Fountains are also seen to yield a Salt like this, because their Waters having passed through places fill'd with this Salt, have dissolved and carried along with them some of it.

Salt-peter differs from these salts I speak of, in that it contains more *spirit*; so that when you take the pains to exalt a part of it, what remains is like my Universal salt. But I shall discourse more amply of that, when I come to treat of the Preparations that are made upon *Salt-peter*.

Vitriols, *Alums*, and all other *Salts*, that are naturally found in the Earth, may be explicated

upon the same principle ; for according as Acid Liquors do meet with different earths, they produce different Salts.

From *Vegetables* are drawn two sorts of Salt, the one Volatil and Essential, the other Fixt and Alkali. The first is called Volatil, in comparison with the Fixt, that the strongest fire is not able to sublime ; and Essential, because it contains all the virtue of the Plant : this Salt is in some Plants like unto *Salt-peter*, and in others like Tartar, according as it contains more or less earth. The Fixt Salt of all *Vegetables* is called Alkali, by reason of a Plant called Kali, that abounds in it. These Salts do in like manner proceed from the Universal Salt, which being spread over all the earth, is attracted by the spirits of the Plant, and volatilised, and so made that which is called Essential Salt : the former is taken out of the juyces of Plants, and is full of Spirits ; but the Fixt or Alkali Salt, being incorporated with a great deal of earth, cannot be Volatilised, but must be drawn after Calcination of the Plant.

It is remarkable that this Salt in Calcination becomes a kind of Lime ; for if you cast an Acid Liquor upon it, a great effervescency or ebullition presently follows, and this continues until all the Pores have been sufficiently opened by the Acid points to make way for the igneous particles to fly out, that enter'd into it during the Calcination. Hence it may be said that the violence with which the Acids do penetrate this solid body, and the effort which the Igneous Atoms do make to get out, are the causes of this great
effervescency.

effervescency that is presently observed.

Many stony matters, such as Coralls, Perles, Crabs-eyes, are called Alkalis, by reason of the effervescency that always happens, when you pour Acids upon them. Lastly, all things which do absorbe or sweeten Acids by ebullition are called Alkalis in Chymistry, because of the effervescency which they make in common with the Alkali Salt.

Animals do afford us two sorts of Salt, the one Volatile, and the other Fixt; great quantity of the first is found in them, because Animals do abound in Spirits, which circulating continually do Volatilise it: While it is drawn, an urinous filthy smell is perceived. As for the Fixt Salt, there is but very little of it. It may be drawn as the Alkali of plants. Both sorts are Alkali, that is to say, when you mix them with an Acid, an ebullition presently follows, as I said before.

Of Chymical Furnaces and Vessels.

It is not my design to relate here exactly all the kinds of Vessels and Furnaces that Artists have invented to use in Chymistry. I shall describe only those with which you will be able to perform all Operations, and send curious Persons, who would be more particularly instructed in them, into the Laboratories, where they may learn more on this subject than ever they will be able to do by consulting all the Books in the World.

World. These then are the principal.

The *Furnace* which is most in use among Chymists is that which is called the Reverberatory ; it must be large enough to hold a great Retort, for the Distillation of Acid Spirits, and other things. This Furnace must be fixt, and made of Brick, joyned together with a Lute compounded of one part of Potters-Earth, so much Horse-dung, and twice as much Sand, the whole kneaded together in Water ; let it be two Bricks breadth, that the Furnace being the thicker, the heat may be retained the longer : let the Ash-hole be a Foot high, and the Door contrived, if possible, on the side that the Ayr comes, that when you have a mind to open it, the Fire may be lighted or encreased the more easily ; the Fire-room need not be quite so high ; you must lay a-cross it two Iron-bars of the bigness of your thumb, which will serve you to set your Retort upon ; and the Furnace must be still raised near about a Foot higher, to cover the Retort ; fit to it a Reverberatory or Cover, that may have a hole in the middle with its stopple. This Cover may be made of the same Paste, that I shall presently describe, speaking of Portable Furnaces.

It will be necessary to have several Furnaces of this same fashion ; but they must be of different sizes, to work conveniently according to the bigness of the Vessel you would place in it. For that the Fire may act more vehemently upon the Retort, there must be left but only the space of a fingers breadth all round between the Furnace and the

the Retort. These Furnaces may also serve for Distilling by the Refrigeratory, in the Sea-Bath, the Vaporous, and the Sand-Bath; for you may place the Copper body upon the Iron-barrs, when you would distil by the Refrigeratory. It is easie to do the same with the *Balneum Mariae*. As for the Sand-bath, lay an iron or earthen pan on the barrs, and put sand enough into it for to cover the bottom and sides of the Vessel you desire to heat.

As for Fusions, you must build a Furnace of the same matter and form as those spoken of before; only you must forbear laying the two Iron-bars in it, that you did in the others, for support of the Vessel.

Moveable Furnaces are made of a paste that consists of three parts of broken pots in powder, and two parts of clay temper'd together with Water. Their structure is just like that of the Reverberatory Furnace. You may also leave holes through which the Iron-bars may pass, which support the Retort that they may be easily taken out, when you have a mind to use this Furnace for Fusions.

As for Vessels choose them as much as may be of Earth or Glass; for it is to be feared that those which are made of Metal will communicate some particular impression to the Liquors you put into them; but seeing that sometimes you may have occasion to distil a great many things in a little time you may use the Copper-Cucurbit, or Body Tinn'd, because that Tinne is not so soluble as Copper, and besides hath no such malignous

lignous quality : upon this Cucurbit place a fit head, round about which must be made a kind of Cauldron or Kettle to hold the water that cools and condenses the vapours which rise from the Matter in the *Vesica* so soon as it is heated.

Many Retorts of different sizes are necessary in a Laboratory ; those which are of Earth are convenient for the distillation of Acid Spirits, because they are able to endure the utmost degree of Fire, and will not melt as glass do. The Vessels made of Earth have their Pores as close as glass it self, and preserve the Spirits as well. They who want Earthen Vessels may coat their glass Retorts with the Lute that I shall describe hereafter, that if the glass should melt, when they are distilling Acid Spirits, the Lute may preserve the Matter safe.

Earthen, and Glass Cucurbits, with their Heads, do serve for a great many Operations.

Matrasses both great and small, when they are fitted to the nose of a Limbeck, are called Recipients ; at other times we put things into them to digest : and they are also fit for sublimations. When the neck of one Matrass is put into the neck of another, they are call'd a Double Vessel, and this is done when we desire to circulate Spirits, but then the junctures must be very well luted.

You must also provide many large capacious Recipients for the Distillation of Acid Spirits by a Retort. They must be so very large, that the Spirits may have room to Circulate the more easily.

Many

Many glass Funnel great and small, Viols of glass, Crucibles, Pans, Mortars of glass or stone must not be forgotten, no nor Kettles too, and an Iron Mortar.

Aludels must also have a place there; they are Pots without a bottom, joyned together, and are placed over another Pot with a hole in the middle, to serve for Sublimations.

Of Lutes.

The Fire is often raised to so high a degree as will melt Glass Retorts in a Reverberatory Furnace, wherefore it will be convenient to coat them over with such a Lute, as when dry is able to preserve and contain the matter that is put into them to be distill'd. This Lute may be made after the manner which follows.

Take Sand, the dross of Iron, Potters Earth in powder, of each five pounds, Horse-dung cut small a pound, Glass beaten into powder, and Sea-salt, of each four ounces, mix them all, and with a sufficient quantity of water make a Paste or Lute with which you must coat the Retort all round, to half its neck, and so set it a drying. This same Lute will serve to stop up the junctures of the neck of the Retort with the Recipient.

As for the conjunction of Limbecks, ordinary Glue upon paper will serve turn: but when something very spirituous is distilled, such as the Spirit of Wine, use a wet Bladder, which carries

ries a Glue along with it, that sticks very well. But if the Bladder happens to be eaten or corroded by the Spirits, have recourse to the following Glue.

Take Flower, and Lime, of each an ounce, Potters-earth in powder half an ounce, mix them, and make a moist Paste with a sufficient quantity of the Whites of Eggs.

To Seal Hermetically, is to stop up the mouth or neck of a Glass-Vessel with a pair of Pincers heated red hot. To do this, the neck is heated by little and little with burning coals, and the Fire is encreased and continued, until the Glass is ready to melt. This way of shutting a Vessel is used, when you have put some matter within it that is easie to be exalted, and you have a mind to make it Circulate.

Of the Degrees of Fire.

To make a Fire of the First Degree, two or three coals lighted will suffice to raise a most gentle heat.

For the Fire of the second Degree, three or four coals will serve, to give such a heat as is able sensibly to warm the Vessel, but so as a hand may be able to endure it some time.

For the Fire of the Third Degree, you must cause heat enough to make a Pot boil, that is fill'd with five or six quarts of water.

For the Fourth Degree, you must use Coals and Wood together, enough to give the most extream heat of all.

The

The Fire of Sand, of the filings of Iron, and of Ashes, is made, when the Vessel that contains the matter that is to be heated is covered underneath and on all sides with Sand, or the filings of Iron, or with Ashes; this is done to heat the Vessel the more gently.

All these Fires have their Degrees, but the Ash-fire is the mildest, because the Ashes cannot contain so great a heat as the others.

The Reverberatory Fire is made in a close Furnace, that the heat or flame which always tends upwards, may reverberate or return upon the Vessel which is placed on two Iron bars. This Fire hath its Degrees, but may be raised to a greater violence than the rest.

The Wheel Fire, for Fusion, is made when with lighted coals you encompass all round a Crucible, that holds the matter you desire to put into Fusion.

The *Balneum Maris* is, when a Limbeck containing the matter that is to be heated, is placed in a Vessel fill'd with Water, under which the Fire is made; thus the water growing hot, heats the matter contained in the Limbeck.

The Vaporous Bath is, when a Glass vessel containing some Matter is heated by the vapour of hot water.

*Explication of many Terms that are used
in Chymistry.*

To *Alcoholize*, or reduce into *Alcohol*, signifies to Subtilize, as when a Mixt is beaten into an impalpable powder. This word is also used to express a very pure Spirit; thus the Spirit of Wine well rectified is called the *Alcohol* of Wine.

Amalgamate is to mix Mercury with some melted Metal; this operation serves to render the Metal fit to be extended on some Works, as Gold, or else to reduce it into a very subtile powder, which is done by putting the *Amalgame* into a Crucible over the Fire: for the Mercury subliming into the Air leaves the Metal in an impalpable powder; neither Iron nor Copper can by any means be *Amalgamated*.

Cement is a manner of purifying Gold. 'Tis done by stratification with a hard paste made of one part of Salt Armoniack, two of common Salt, and four of Potters earth, or Bricks powdered, the whole having been moistned with a sufficient quantity of Urine: this Composition is called *Royal Cement*.

Cohobate signifies to repeat the Distillation of the same Liquour, having poured it again upon the Matter that remained in the Vessel. This Operation is used to open Bodies, or to Volatilize the Spirits.

Detonation

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Detonation is a noise that is made when the volatile parts of any mixture do rush forth with impetuosity; it is also called *Fulmination*.

Fermentation is an ebullition raised by the Spirits that endeavour to get out of a Body; for meeting with gross earthy parts that oppose their passage, they swell and rarifie the Liqueur until they find their way out.

Filtrate is to purifie a Liqueur by passing it through a Coffin of brown paper.

Fumigate is to make one Body receive the Fume of another.

Granulate is to pour a melted Metal drop by drop into cold water, that it may congeal into grains.

Levigate is to reduce a hard Body into an impalpable powder upon a marble.

Mortifie is to change the outward form of a Mixt, as is done in Mercury. Also Spirits are said to be Mortified, when they are mixed with others that hinder or destroy their strength.

Rectifie is to Distil Spirits, for the separation of what Heterogeneous parts might have been drawn along with them.

Revive is to restore a Mixt to its former condition that lies disguised by Salts or Sulphurs. Thus Cinnaber, and the other preparations of Mercury are Revived into Quick-silver.

Stratifie is to lay different matters bed upon bed. This operation is performed when we would Calcine a Mineral or Metal with a Salt, or some other matter.

Sublime is to raise by Fire any Volatile matter to the top of the Cucurbit, or into its Head.

THE



THE
FIRST PART.
Of Minerals.

CHAP. I.

Of Gold.

Gold is most esteemed among the seven Metals, because it is more perfect, more weighty, and is thought to receive the influence of the most glorious body among the Stars, which is the Sun. It is also called the King of Metals, for the same reason; it is a matter most compact of any, malleable, unequal in its parts; insomuch that Pores of different figures are observed in it, when it is viewed with a good Microscope.

Gold is a good Remedy for those who have taken too much Mercury; for these two Metals do easily unite together, and by this union or *Amalgamation* the Mercury fixes, and its motion is interrupted. This is plainly enough perceived in such

as have received the Frictions with Mercury ; for if they do but hold a piece of Gold in their mouth a little, it will grow white by the vapour of the Quick-silver.

Purification of Gold.

Put as much Gold as you please into a Crucible, make it red hot, and when it begins to melt, cast into it four times as much Antimony in powder, the Gold will presently melt ; continue a strong Fire, until you perceive the Matter to sparkle.

Then take your Crucible out of the Fire and knock it, that the *Regule* may fall to the bottom. Break it when it is cold, and separate the *Regule* from the dross that remains a top of it: If you have a mind to save your Crucible, pour out the matter that lies in Fusion into an Iron Mortar made like a Founders Mould, which you shall have heated a little and greased before-hand, then strike about the Mortar with a pair of tongues, till the matter settles in a Mass.

Let this Mass cool a little, then flinging it out separate the Golden *Regule* from the Dross. Weigh this *Regule*, melt it again in a Crucible over a strong Fire, and when it shall come to melt, throw into it by little and little three times as much Saltpeter : continue a good strong Fire, that the matter may remain in Fusion, and when the Fumes are all gone, and it appears clear

clear and clean, cast it into your Iron Mortar warm'd and greas'd as I said but now, or else leave it in the Crucible that you shall beat while it is cooling, for the separation of the Regule from the Dross that remains a top, and your Golden Regule will prove perfectly pure.

Remarks.

The ordinary way of purifying Gold is the *Coppel*, in which the same method is used that I shall speak of in the Purification of Silver. But the Coppel not being able to separate Silver from Gold, recourse is had to another Operation, that is called *the Departure*.

Melt Three parts of Silver with one part of Gold, in a Crucible over a good Fire, and when this mixture is in Fusion, cast it into cold water, it condenses into Grains, which being dried, a separation of the Silver from the Gold is made by the means of *Aqua fortis*; for this *Menstruum* dissolves Silver very well, but the Gold remains in powder at the bottom of the Vessel, for the reason that I shall relate in the Chapter of *Aqua Regalis*. The Dissolution of Silver is poured off by Inclination, then the Powder of Gold is washed to become sweet.

But it often happens that some particles of the Silver do still remain united with the Gold, so that this Purification cannot be said to be altogether perfect.

There is another method of Purifying Gold, to wit, *Cementation*, which is thus performed.

Stratifie in a Crucible thin plates of Gold, with a dry paste, that is called Cement, in which the *Salts Gemma* and *Armoniack* do enter; cover the Crucible, and having made a Circular or wheel-fire, Calcine the matter for ten or twelve hours with a violent heat, that the Salts may eat and consume the impurities of the Gold: but nevertheless they leave it still impregnated with other Metals.

The Purification of Gold by the means of Antimony is better than any other; for there is nothing but Gold that is able to make any resistance against this devourer; it often eats some portion of it, but never leaves in it any other Metal.

You must remember to lay a Tile under the Crucible, for fear that the air which comes by the Ash-hole, should happen to cool the bottom of the Crucible.

Gold presently melts as soon as the Antimony is cast into the Crucible, by reason that Antimony contains some Saline Sulphurs, which do encrease the force of the Fire, and do separate the parts of this Metal; it is then that the more porous and volatile uniting with the Antimony one part evaporates into Smoke, and the other remains fixt in the Dross.

The sparkles which toward the end do fly out of the matter do proceed from some Particles of Antimony, which finding themselves intangled in the Gold do use violence to get out.

Then

Then take your matter off the Fire that it may lose none of its substance, and pour it into an Iron Mortar as I said before. After this the Regule is melted once more, and *Salt-peter* cast into it to absorb or receive all the Antimony that may yet remain, and so by this means you have a Regule as well purified as may be.

Amalgamation of Gold with Mercury, and its reduction into an impalpable Powder,

Take a Drachm of the Regule of Gold, beat it into very thin little Plates, which you must heat in a Crucible red hot over a large Fire; then pour upon it an Ounce of Quick-silver revived out of Cinnaber, as I shall shew hereafter; stir the matter with a little Iron-rod, and when you find it begin to raise a fume which quickly happens, cast your mixture into an Earthen Pan fill'd with Water, it will coagulate, and become maniable; wash it several times to take away its blackness; thus you have an Amalgame, from which you must separate the Mercury that you find not united, by pressing it a little between your fingers in a linnen cloth. The Gold retains about thrice its weight in Mercury.

Now to reduce this Gold into Powder, you must put this Amalgame into a Crucible over a gentle fire, the Mercury will evaporate into the Air, and leave the Gold at bottom in an impalpable Powder.

Remarks.

Mercury doth easily penetrate Gold, and insinuating into its Pores makes a soft matter that is called Amalgame; it doth the same with other Metals too, except Iron and Copper, which are too ill digested to receive its impression.

The Amalgamation of Gold is useful to Gilanders, for so it is easily extended upon their works.

Aurum Fulminans, called Saffron of Gold.

Take what quantity you please of Gold beaten into thin plates, put it into a Viol, or Matrafs, and pour upon it by little and little three or four times as much *Aqua Regalis* compounded after the manner I shall shew in its proper place. Set the Matrafs upon Sand a little warm, until the Gold be all of it dissolved, which happens in half an Hour at most; pour your solution into a Glass-vessel of five or six times as much common Water. Afterwards drop into this mixture by degrees the Volatile Spirit of Salt Armoniack, or the Oyl of Tartar made by *Deliquium* or Solution, you'll find the Gold precipitate to the bottom of the Glass. Let it alone a good while, that all the Gold may fall down, then pouring off the Water by Inclination wash your powder with warm Water, till it grows insipid, and so dry it
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in Paper at a gentle fire, because it is apt to burn, and the Powder would flye away with a terrible noise.

Aurum Fulminans causes sweat, and drives out ill humours by Transpiration. It may be given in the Small Pox from two to six grains in a Lozenge, or Electuary. It stops Vomiting, and is also good to moderate the active motion of Mercury.

Remarks.

Thin Plates of Gold are made use of in this operation, that its dissolution may be more easily performed.

You must pour the *Aqua Regalis* by little and little, to avoid the great effervescency that might be able to drive it out of the Matrafs. This effervescency proceeds from the violent division of the particles of Gold by the *Aqua Regalis*; for when it finds no more bodies to act upon, having divided the Gold into as many parts as 'tis possible, the ebullition ceases, and though the Gold doth all remain in the *Aqua Regalis*, it becomes so imperceptible to us, as it seems the Water hath changed it from what it was before, it appears so very clear and transparent.

The Oyl of Tartar, or the Spirit of Salt Armoniack is used for the Precipitation of Gold, because both those Liquors do contain an Alkali Salt, which being mixed with Acids must cause a Fermentation. Now in this Fermentation the parts

parts of *Aqua Regalis* that held up the particles of Gold do grow weak, and having no more force to retain them longer, they must needs precipitate by their own weight.

Perhaps some may find a difficulty in comprehending how the Volatile Spirit of Salt Armoniack should come to weaken the *Aqua Regalis*, that is it self compounded of Salt Armoniack; but there will be no difficulty at all, when they shall consider that the force of the *Aqua Regalis* doth not so much depend on the volatile part of the Salt Armoniack, as on the Sea-salt, that is in good store in it united with the *Aqua Fortis*; for Sea-salt, or Sal Gemma may be substituted very well in the place of Salt Armoniack for making *Aqua Regalis*, as I shall observe hereafter speaking of the composition of this Water. It may be also enquired here, why the Dissolvents do quit the bodies they held before in Dissolution, to betake themselves to some other: for example, why the *Aqua Regalis* leaves the Gold it was impregnated with, to give way to the Alkali Salt. This question is one of the most difficult to resolve well, of any in Natural Philosophy.

Nevertheless, I'll give you my opinion of what can be said most sensible on this Subject.

I do suppose that when the *Aqua Regalis* hath acted upon Gold, so as to dissolve it, the points or edges that enabled it to do so, are fixed in the particles of Gold. But seeing that these little bodies are very hard, and consequently hard

to penetrate, these points do enter but very superficially, yet far enough to suspend the particles of Gold, and hinder them from precipitating. Wherefore if you would add never so much Gold more, when these points have seized upon as much as they are able to joyn with, they cannot possibly dissolve one grain more; and it is this suspension that renders the particles of Gold imperceptible. But now if you add some body that by its motion and figure is able to engage the Acids enough to break them, the particles of Gold being left at liberty will precipitate by their own weight. And this is what I conceive the Oyl of Tartar, and Volatile Alkali Spirits are able to do. They are impregnated with very Active Salts, which finding bodies at rest presently fall to move them, and by the quickness of their motion do shake them so violently, as to break the points by which they were suspended; and this occasions the Ebullition which presently happens when these Spirits are poured upon the Dissolution.

These edges then being thus broken, two things must follow thereupon. The first is that the remaining *Aqua Regalis* is rendred incapable of dissolving any more Gold, because it hath no more power left of making a penetration. The second is, that the precipitated Powder of Gold is impregnated with some part of the Dissolvent, by reason that the sharpest part of these edges remains within it.

Experience teaches us both the one and the other: to wit, the force of the *Aqua Regalis* is quite

quite destroyed for dissolving any more Gold, and the precipitated Powder hath drawn along with it some Spirits that are so closely lockt up, that though it be several times washt in warm Water, they cannot possibly be disengaged from their hold. And this is evident, when it is put upon the Fire; for the great Detonation, or noise that it makes, cannot proceed from any thing else, but the inclosed Spirits which violently divide the most compact body of Gold to get out quickly, when they are forced to it by the action of Fire.

I can here explicate by the by, after the same manner, the action of a certain Powder, consisting of three parts of Niter, two parts of Salt of Tartar, and one part of Sulphur. This Powder being heated in a Spoon to the weight of a Drachm, gives as Thundring a noise as a Canon it self. Now the fixt Salt of Tartar causes in this Powder what the Gold did in the other; that is to say, it retains the spirits of Niter and Sulphur so lockt up, that they cannot be separated without violently breaking their Prison; and this is that which makes such a noise.

Aurum Fulminans taken inwardly causes sweat, because the heat of the Body volatilises it, and drives it through the Pores. Now if the pores are very open, it will only cause an insensible transpiration: but if they are closed up by the coldness of the weather, so that it must remain some time before it passes; the vaporous humidity which bears it company, dissolves upon the skin into what we call sweat.

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Some think the Gold contributes nothing at all to these transpirations, and that the spirit of Niter alone being forced by the heat of the body to pass through its Pores causes all the action. But I conceive it is more likely that these spirits do carry along with them some parts of the Gold, with which they are so intimately mixed. And by this explication may be better comprehended, how so small a quantity of spirits is able to produce sweat; for suppose there passes through the Pores one grain of Gold, and two grains of spirits, these spirits being, as I may so say, armed with the grosser parts of Gold, will be better able to conquer the resistance that shall oppose their passage, than if they were separate; after the same manner as a good piece of Timber that is driven along by the stream of a River will strike with much more violence against the Arch of a Bridge, and endanger it much more, than a single Wave would be able to do, though never so swift.

I have already said, that Gold doth repress the violence of Mercury, because it doth Amalgamate with it; but *Aurum Fulminans* doth it much better, for being volatile it is more easily carried through all the body, and fails not to find out the Mercury, wheresoever it lies.

C H A P. II.

Of Silver.

S*ilver* hath the second place among Metals, it is a very compact body, more smooth and polished by nature than Gold, and its pores are more even upon the surface. It is malleable like Gold, but will not so easily yield or extend under the Hammer, and is not so weightry.

It is called by the name of the Moon, as well from its Colour, as from the Influences our Forefathers thought it received from the Moon. Many properties are attributed to it against Diseases of the Head; but these pretended Virtues seem to have no other foundation than the imagination of Astrologers and Chymists, who were of the opinion that the Moon had a great deal of correspondence with the Head. There is no need I should enlarge in confutation of this opinion, experience every day teaches us that it is a pure abuse.

Silver may be also given like Gold for Diseases caused by too much Mercury; for they suffer an Amalgamation very well together.

Purification

Purification of Silver.

Silver is Purified by the Coppel after the following manner : take a Coppel made of the Ashes of Bones or Horns, cover it and heat it gently over the coals, until it grows red-hot, then cast into it four or five times as much *Lead* as you intend to purifie *Silver* : let the *Lead* melt, and fill the sides of the Coppel, which is soon done ; then cast your *Silver* into the middle, and it will presently melt. Lay wood round about the Coppel, and blow it that the flame may reverberate on the matter, the impurities will mix with the *Lead*, and the *Silver* remain pure and clean in the middle of the Coppel, while the *Lead* being fill'd with the droffie parts of *Silver* lies on the sides like a scumm, that you may gather up with a spoon, and this is that which is called *Litharge*, which according to the degree of Calcination it hath endured, becomes of divers Colours, and sometimes is called *Litharge of Gold*, and sometimes *Litharge of Silver*. If you leave it in the Coppel, it will pass through its Pores.

For you must observe that the Coppel being expressly made of Ashes deprived of Salt, is very Porous ; you must continue the Fire till there rise no more vapours.

This Preparation cleanses *Silver* from all other Metals, except *Gold*, which resists the power of the Coppel. You must therefore have recourse to the Operation I described, when I spoke of the
Purifica-

Purification of *Gold*; for *Aqua fortis* dissolves *Silver*, but not being able to penetrate *Gold*, leaves it in a powder at the bottom.

Pour off then by Inclination the dissolution of *Silver* into an Earthen pan, wherein you shall have laid before-hand a plate of Copper, and ten or twelve times as much common Water. Let this mixture lye still for some hours, and when you find the Copper covered all about with the Powder or Precipitate of *Silver*, and the water becomes Blew, Filtrate it, and you have that which is called *Aqua Secunda*: It is good to make the Eschar fall in Chancres, and to consume proud flesh. Dry the powder of *Silver*, and if you desire to keep it in an *Ingot*, melt it in a Crucible with a little *Salt-peter*.

If you steep a plate of Iron some hours in the *Aqua Secunda*, the Copper which made it look Blew will precipitate according as the Iron dissolves. If you Filtrate this dissolution, and put a piece of the *Lapis Calaminaris* into it, the dissolv'd Iron will fall to the bottom in powder, and the Stone will dissolve. If you Filtrate this water, and pour upon the Filtration drop by drop the water of fixt *Niter*, the *Lapis Calaminaris* will precipitate. Lastly, if you Filtrate this Water too, and having evaporated a part of it, set the rest a Crystallizing, you'll meet with a *Salt-peter* that burns like the ordinary sort.

Remarks

Remarks.

The Coppel is an Earthen Vessel that resists the Fire, made like a dish: it is fill'd with a Paste made of Ashes that have lost all their Salt, such as those of Bones; which lose all their Salt while they are a burning, because it is so Volatile: a hole is made in the middle to let in the matter that is to be Coppell'd, and so the Vessel is set a drying.

You must put *Lead* into the Coppel, in proportion to the impurities that are in the *Silver*; commonly they put four times as much. That which is here called Impurity is nothing else but some parts of other Metals, that superficially adhered to the *Silver*, when it was taken out of the Mine. These Metals do mix much better with *Lead* than *Silver*, because the *Lead* is full of Sulphurous porous parts which readily engage and receive other Bodies. On the contrary *Silver* hath Pores exceeding close and strait, and can neither be penetrated nor unite with these Matters but only superficially; so that in the Fusion they do separate and only slide over this Solid Body. It is also remarkable that the hardness of *Silver*, and strait contexture of its parts do hinder the Fire from melting it after the same manner as other Metals, that are more porous; and this is the reason it remains unmixed among them.

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Silver

Silver melts much sooner by being put into melted *Lead*, than if you had endeavour'd to melt it alone in the Crucible, because *Lead* contains many Sulphurous parts that are very serviceable for the Fusion of Metals. The flame is made to Reverberate on the *Silver*, to drive all Heterogeneous substances towards the sides.

The Departure is when a Dissolvent quits the Metal it held dissolved to betake it self unto another. Thus when Copper is put into the Dissolution of *Silver*, the *Aqua fortis* leaves the *Silver* as fast as may be to fall upon Dissolving the *Copper*; and the reason of this is, because the *Copper-particles* do so stir and shake the edges of the Dissolvent, as to make them let go their hold. *Iron* precipitates *Copper*, the *Lapis Calaminaris* precipitates *Iron*, and the Liquor of fixt *Niter* doth so to the *Lapis Calaminaris* for the same reason.

I shall in the sequel of this Book describe the manner of preparing the Liquor of fixt *Niter*: the Salt that it contains reunites with the Volatile Spirits of *Salt-peter* that were in the *Aqua fortis*, insomuch that the *Salt-peter* revives again.

Crystall of Silver, called Vitriol of the Moon.

Dissolve one or two ounces of *Coppel-Silver* in three times as much Spirit of *Niter*; pour
forth

forth your dissolution into a Glafs-Cucurbite, set over a gentle Sand-fire; Evaporate about the fourth part of the moisture, and so let the rest cool without stirring it, it will turn into *Crystals* that you must separate from the Liquor, and after you have dried them, keep them in a Viol well stoppt. You may again fall to Evaporating of half the remaining Liquor, and set it a *Crystallizing* as before. You may repeat these Evaporations and Crystallizations till you have got all your *Silver* to turn into *Crystals*.

This *Vitriol of the Moon* is used to make an *Eschar* by touching the part with it. It is also given inwardly for *Dropsies*, and for Diseases of the Head, from two unto six Grains, in some Specifick Water: it purges gently.

Remarks.

You must put your *Coppel-Silver* into a Viol or *Matrass* large enough be sure, and pour upon it only as much *Spirit of Niter* as will serve to Dissolve it; now that comes to about three times its weight. Indeed you may use *Aqua fortis* instead of the *Spirit of Niter*, if you please, in this Operation; but I rather chuse the *Spirit of Niter*, because it is found to act with more celerity than *Aqua fortis*. You may read in their proper places the description I have given you of them both, and the Remarks I have made upon them. Place your Vessel upon Ashes or Sand, a little warm for to hasten the

Diffolution. When the *Acid Spirits* begin to penetrate the *Silver*, an Ebullition presently rises accompanied with a very considerable heat, because these sharp edges do break those obstacles that hindred their entrance, and violently force their passage. It is this great motion, and impetuous dispersion of parts, that produces the heat and ebullition, and by rarefaction of the *Spirit of Niter* sends forth through the neck of the Vessel a Red fume or vapour, that you must be very careful to avoid, as a thing very unwholsom, and prejudicial to the Breast. The Smoke and Ebullition do remain until the *Silver* is all of it dissolved, after which the Liquor becomes clear and transparent as before. A little of it is evaporated, that the rest may *Crystallize* the easier, for that which evaporates is little better than a kind of insipid water, the *Silver* still retaining the more *Acid fixt Spirits*.

Now you must observe in all Crystallizations not to leave too much moisture, for fear of weakning too much the *Salts*, and so hindring their Coagulation. Nor must you leave too little moisture; for the Crystals not finding room enough to extend themselves in, would confusedly fall one upon another.

These Crystals can be dissolved in Water like Salt, their strength depends on the *Spirits of Niter* that are incorporated with them: wherefore they weigh more than the *Silver* did that was employed; and it is these *Spirits* which pierce and gnaw the flesh on which these Crystals are applied, when an *Eschar* is to be made. It
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is likewise they which cause that Fermentation of humours by which they purge, when these Crystals are given inwardly.

If you have a mind to revive these *Crystals* into *Silver* again, you must only put them into warm Water, and lay therein a plate of *Copper*. They will then dissolve, and the *Silver* precipitate to the bottom in a White powder, that is to be washed and dried; afterwards melting it in a Crucible with a little *Salt-peter*, it will return into Ingots of the same weight as before.

Infernal Stone, or Perpetual Causlick.

Dissolve in a Viol what quantity of *Silver* you please, with three times as much *Spirit of Niter*; set your Viol upon a Sand-fire, and evaporate about two thirds of the moisture; pour the rest as it is hot into a good *German* Crucible, that must be large enough by reason of the Ebullitions that are made in it. Place it over a gentle Fire, and let it alone till the boiling matter sinks quietly to the bottom. Then encrease your Fire a little, and it will come to be like Oyl: pour it out into an Iron mould a little oil'd and heated, it will presently coagulate or harden; after which you may keep it in a Viol well stoppt. It is a *Causlick* that will remain for ever, provided you don't let it be expos'd to the Air. This *Stone* may be made of *Copper* instead of *Silver*, but will not keep so well; because the *Copper* being very porous doth suffer the Air to enter easily and dissolve it.

Remarks.

The Effect of this *Stone* proceeds from the Corrolive *Spirits of Niter*, which do remain incorporated with the *Silver*. It is more *Caustick* than the *Crystals* I now spoke of, though compounded of the same ingredients. The reason of it is, that in the Evaporation of the *Spirit of Niter*, the sharpest part remains at last; and it is that which gives this strength to the *Infernal Stone*. But in the *Crystal* there's a much weaker Spirit, as being impregnated with Watry parts.

If you would melt the *Crystals* of the *Moon* in a Crucible, and boil the Liquor till it come into the consistence of Oyl, and afterwards cast it into the Iron mould, you would have an *Infernal Stone* like this I have described.

Tincture of the Moon.

Dissolve in a Matrafs upon Sand a little warm two ounces of *Silver* with six ounces of *Spirit of Niter*. Pour the dissolution into a Cucurbit, or other Glass-vessel, wherein you shall have put a Quart of Salt-water well Filter'd, the *Silver* will presently precipitate in a very White powder. Let it lye a while that all the Powder may fall, and then pour off the water by Inclination. Wash your Powder several times with Fountain-water to take away the Acrimony of the Salts: dry it upon

upon Paper, and put it into a Matrafs. Pour upon it an Ounce of the Volatile Salt of Urine, and four and twenty Ounces of the Spirit of Wine Rectified with the *Salt of Tartar*, after the manner I shall shew hereafter. Stop this Matrafs with another : that is to say, let the mouth of the one enter into the neck of the other, and this is that which is called a *Double-Vessel*. Lute well the junctures with a wet bladder, and digest the Matter in Horse-dung, or some such gentle heat, for a Fortnight, during which time the Spirit of Wine will have got a bright Sky-colour. Unlute your Matrafs, and Filtrate the Liquor through a Coffin of Brown paper, and so keep it in a Viol well stopt. You may use this *Tincture* for the Epilepsie, Palsie, Apoplexy, and other Diseases of the Head. It is also used in Malignant Feavers, and all other Diseases wherein it is requisite to drive out the humours by Perspiration. The Dose is from six to sixteen drops in a convenient Vehicle.

There will remain at the bottom of the Matrafs a *Calx* of Silver that may again be revived by means of the following Salts.

Take Eight ounces of *Niter*, Two ounces of Crystal powdered according as I shall shew hereafter, so much *Tartar*, and half an ounce of coals ; Powder them all, and put it by little and little into a Crucible heated red-hot, a great Detonation will happen, after which you'll find the matter melted, pour it into a warm Mortar, and let it cool, you'll have a Mass that you must powder, and mix an equal weight of it with so much *Calx*

of *Silver*. Melt this mixture in a Crucible over a strong fire, and the *Calx* will revive into Silver: take your Crucible out of the fire, and break it when it is cold, then separate your Silver from the salts.

Remarks.

This Operation seems at first to favour the opinion of those who hold there can be a separation of the Principles of Silver: for, say they, what is it can give this blew colour, after that the Silver hath been a long time digested with the Volatile Salt of Urine, and the spirit of Wine *Alcoholized*, but an inward sulphur of the Silver that separates from it by the means of this sulphurous Liquor, and mixes with the Liquor, much after the same manner as we find these sorts of *Menstruums* usually dissolve the sulphur of Vegetables, Animals, and Minerals, and let alone their terrestrious and saline parts? But when we consider this Tincture a little nearer, we shall find it to be nothing but a dissolution of some part of the Silver it self, that hath been volatilized by the salt of Urine, and afterwards united with the spirit of Wine; so that if you draw off or revive this dissolved Silver, there will remain no longer a Tincture, and here's the way for you to do it.

Pour your *Tincture* of the *Moon* into a Glass-Body, cover it with its head, and fit a Receiver to it, lute the junctures close, and distill,
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in a Vaporous Bath, about half the moisture, you'll have a Liquor as clear as the spirit of Wine. Put your Cucurbit into a cool place, and leave it there two Days without stirring it, you'll find little Crystals on the sides, pour off the Liquor gently, which hath now lost much of its skie-colour. Gather your Crystals, and continue to distill and crystalize the rest of the Liquor, till you have recover'd all that is in it. Mix all your Crystals, dry them, and weigh them; and if you have half an ounce of them, powder them, and mix with six drachms of the matter I described for reviving the *Calx* of Silver remaining in the Matrafs: put this mixture into a Crucible, and covering it with a tile, light a strong fire about it, to set the matter into fusion; then taking it off the fire, and letting it cool, break the Crucible, you'll find the Silver at the bottom, which will be fit for the same Operation again, when you please. Note that all the Liquor which was drawn by Distillation, is as clear as common Water: wherefore I conclude that the Colour did consist in the dissolution of Silver it self, and not of its sulphurs, as some have thought.

You must cut the Silver into little pieces or plates, that it may dissolve the easier.

Salt-water must be made of an ounce and a half of Salt dissolved in a Quart of Water: this salt precipitates the silver; because it engages the points of the dissolvent, and shaking them violently about makes them let go the hold they had with other bodies.

Silver may be also precipitated by means of a
Copper-

Copper-plate, as I have said already.

It is very indifferent which way you please to Precipitate it, for it is done for no other end, but to reduce the *Silver* into a very fine Powder, for an easier dissolution.

There is no need of distilling some part of the Liquor, that the Tincture may be the stronger, as some have presumed to write: for on the contrary, it causes a Crystallization, which diminishes both its colour and strength, for the reason I have given before.

The effect of this *Tincture* for Diseases must rather be attributed to the Salt of Urine, and spirit of Wine, than to the Silver; for they are not only able to flye into the Head, and open obstructions there, but assisted with the Natural heat do open the Pores of all the Body, and drive out ill humours by transpiration.

The portion of *Silver* which remains at the bottom of the Matrafs being impregnated with volatile parts would flye into the Ayr, if it were melted alone without the addition of something else; wherefore the above mentioned matter is added to it, that being of a very fixt nature may weigh it down, and hinder it from flying away.

Diana's Tree.

Take an ounce of Silver, and dissolve it in three ounces of the spirit of Niter, pour your dissolution into a Matrafs, wherein you shall have

have put eighteen or twenty ounces of Water, and two ounces of Quick-silver. Your Matraass must be fill'd up to the Neck, let it lye still upon a little round of straw in some convenient place for forty days together, during which time you'll find a Tree spread forth its branches, and little balls at the end, which represent their fruit.

This Operation is of no use at all in Physick, I have here described it only to please the Curious.

Remarks.

These branches do proceed from the spirit of Niter, which being incorporated with the Silver and Mercury do forme divers Figures, according to the room and moisture it hath to expatiate it self in. For if you should put to it but ten or twelve ounces of Water, nothing but a kind of Crystals in great confusion would be able to appear. On the contrary, if you should use too much Water, nothing would then be seen besides a little precipitated powder. You must let the mixture lye still for forty days together, because the spirit of Niter being very much weakned by common Water is able to work but very slowly. If the matter should happen to be remov'd, the Figure would quickly fall into confusion, but would recover it self again, if you let it lye still long enough. This preparation is best performed in a cool place, being properly a CrySTALLIZATION. This

This Operation may be fitly compared with the manner of Generation and Nourishment of Plants in the Earth; for if the seed abounds with too much moisture, the spirits which serve to ferment and dilate its parts, will be rendred so weak, as not to be able to act, and so nothing can be produced; if on the contrary there should prove too little moisture, the spirits not finding room enough to expatiate in, would either continue imprisoned or evaporate into Ayr, and so be ineffectual. But when there happens to be a fit proportion of Water in the Earth, then the spirits gently moving about do insensibly expatiate themselves, and do rarifie and sublime along with them the substance of the seed, from whence Vegetation doth proceed. But to return unto our Operation.

If you should desire to separate the Silver from the Mercury, shake the whole together, and having poured it out into an earthen Vessel, make it boil for half a quarter of an Hour, then let it cool a little, till it becomes little more than luke warm; pour upon it a quart of Water by little and little, in which you have dissolved two ounces of Sea-salt, a white *Precipitate* will fall down; pour off the Water by Inclination, and dry the Powder. Then put it in a Retort upon a Sand-furnace, and having fitted to it a Receiver fill'd with Water, give a small fire at first, then encrease it by degrees, till the Retort grows red-hot, and your Quick-silver will distill drop by drop into the Water; continue the fire till nothing more will distill; let the Vessels cool;
pour

pour the Water out of the Receiver, and having washt the Mercury, dry it with linnen, or the crum of bread, and keep it for use.

You'll meet with your Silver in the Retort, which you may reduce into an Ingot, by melting it in a Crucible with a little Salt-peter in a great Circular Fire.

C H A P. III.

Of Tinn.

T*inn* is a Metal that comes near unto *Silver* in colour, but differs very much, in the figure of its Pores, in the solidness and weight. The name of the Planet *Jupiter* is given unto it, and it is thought to receive its particular Influence from it. It is a malleable substance, and very easie to put into Fusion. It will not all of it quite dissolve in *Aqua Fortis*, as some have affirmed, but some part of it will remain undissolved, which shews it is compounded of different parts, and that its Pores are of a different figure. A virtue hath been attributed to it against the Diseases of the *Liver* and *Matrix*, but this quality is only imaginary, experience in no wise evincing the truth of it.

Calcination

Calcination of Tinn.

Put your *Tinn* into a large earthen Pot unglazed, place it in a Circular Fire, the *Tinn* will melt. Stir it with a *Spatule*, until it is reduced into Powder.

If you would only have the Powder of *Tinn*, without calcining it, cast it when you have melted it into a great wooden Box, that you shall have rub'd all the inside of with Cerufs. Cover this Box, and presently shake it about till your *Tinn* grows cold, and you'll find it in a Powder.

Sublimation of Tinn.

Take equal parts of *Tinn* and *Salt Armoniack* in Powder: mix them well together, and put your mixture into a strong earthen Cucurbite, that is able to endure the fire; fit unto it a blind Head, lute the conjunctions exactly well, and place your Vessel on the grate in a small Furnace with an open fire, but only open so as that the fire can only pass through the Registers, and for that end you must stop up the top of the Furnace with Bricks and Lute, leaving some little holes on the sides that are called Registers. Your Cucurbite must likewise enter the Furnace a third part of its height or thereabouts. Give a small fire at first, then encrease it by degrees, till the
bottom

bottom of the Cucurbite is grown red-hot, and continue such a Fire till nothing more will Sublime, which you'll know by the Heads growing cool, and then the Sublimation is at an end. Let the Vessels cool, and so unlute them, you'll find *Flowers* stuck to the Head, and to the top of the Cucurbite, that are nothing else but some parts of *Tinn* raised up by the Salt Armoniack, and at the bottom of the Cucurbite you'll find some *Tinn* revived.

Magistery of Jupiter, or Tinn.

Dissolve the *Flowers of Tinn*, that I now described, in a sufficient quantity of Water. Filtrate the Dissolution, and pour upon it drop by drop the Spirit of Salt Armoniack, or the Oil of Tartar made *per Deliquium*, there will Precipitate a very White powder. You must Edulcorate it by washing it several times with warm Water, and afterwards dry it. It serves for Paint, for being mixed with *Pomatum*, it makes a very curious White.

Remarks.

It is to be consider'd in both these Preparations, that the Dissolution of Tynn is performed only by an Acid Salt, that the Salt Armoniack is impregnated with; and this is the reason why the Volatile Spirit of Salt Armoniack doth serve to

to Precipitate it ; for being an *Alkali* as well as the Oil of Tartar, it breaks the force of the Acid, which therefore lets go what it held dissolved. That being granted, there will be no longer difficulty in conceiving how the Volatile Spirit of Salt Armoniack doth often Precipitate what the Salt Armoniack had dissolved.

Salt of Jupiter, or Tinn.

Take what quantity you please of the *Magistery of Tinn*, and having poured upon it good Distill'd Vinegar three Fingers high, put it in Digestion on warm Sand for two or three days, stirring your Matter ever now and then. Then pour off the Liquor by Inclination, and add new Vinegar to the Matter that remains. Digest it as before, pour it off, and repeat doing thus, until your *Magistery of Tinn* be dissolved almost every jott. Then Filter all these Impregnations, and Evaporate them in a Glass Cucurbit over a Sand-fire to the consumption of three Fourths. Let the remainder cool, and carry your Cucurbite, without moving it, into a Cellar, or some other cool place, leave it there three or four days, you'll find Crystals on the sides. Separate them from the Liquor, Evaporate part of it again, and put the remainder into your Cellar as before, you'll find new Crystals. Continue these Evaporations and CrySTALLIZATIONS, till you have drawn out all your *Salt of Tinn* which you must dry upon Paper in the Sun, and keep it in a Viol. This

This Salt is Desiccative, being mixed in *Pomatus*. It may be used for Tettars, like the Salt of Saturn.

They who care not for having this Salt in Crystals, may gently Evaporate the Dissolution, and there will remain a Salt as good as the former.

Remarks.

This Salt consists of nothing else but the Acids of Vinegar incorporated into the particles of *Tinn*; but if you should destroy these Acids, the *Tinn* would easily recover its ancient form. I shall shew you the manner of Reviving it, when I come to speak of the Salt of Saturn; for it may be revived after the same manner.

It is to be considered here, that you must reduce the *Tinn* into Flowers, before you offer to dissolve it in Vinegar; for Calcine it how you please, it will never dissolve.

You may change this Salt into Magistery again by Dissolving it in distilled Vinegar, and afterwards dropping into it the Oil of Tartar, which by breaking the Acids of the Vinegar will Precipitate the *Tinn*.

C H A P. IV.

Of Bismuth, called Tinn-Glass.

Bismuth is a *Marcaffite*, that many think to be an imperfect Tinn. It is found near the Tinn-Mines, and also in them.

There is another sort of *Marcaffite*, called *Zinch*, that much resembles *Bismuth*, and on which the same preparations may be made that I am going to describe.

Marcaffite is nothing else but the excrement or *faces* of a Metal, or an Earth impregnated with Metallick parts.

The *Pewterers* do mix *Bismuth* and *Zinch* in their *Tinn* to make it sound the better.

Flowers of Bismuth.

Calcine *Bismuth* as you do *Lead*, then mixing it with an equal part of Salt Armoniack, proceed to its sublimation as you did in that of *Tinn*. Thus you have *Flowers*, that you may dissolve in Water, and Precipitate with the Spirit of Salt Armoniack, or Oil of Tartar.

This *Magistery* or *Precipitate* serves for the same use as this which follows.

Magistery

Magistery of Bismuth.

Dissolve in a Matrafs an ounce of *Bismuth*, grossly powdered with three ounces of Spirit of Niter. Pour the Dissolution into a clean White-Ware Vessel, and pour upon it five or six pounds of Fountain-Water, in which you shall have dissolved before-hand an Ounce of Sea-salt, you'll see a White powder Precipitate to the bottom. Pour off the Water by Inclination, and wash this *Magistery* several times, then dry it in the shade. It is an excellent *Cosmetick*, called *Spanish White*, that serves to Whiten the Face. It is either mixed in *Pomatum*, or *Lilie-water*.

Remarks.

This *Magistery* may be made without Salt, but it is much sooner done when Salt is used; besides some of the *Bismuth* will continue dissolved in the Water, when it is not Salted.

I shall explicate after what manner *Aqua fortis* doth act upon Salt, when I come to speak of *Aqua Regalis*.

The Fountain-water doth nothing but weaken the strength of the dissolvent that held up the *Bismuth*, insomuch that being forced to let go its hold, the *Bismuth* Precipitates by its own weight.

Commonly one Drachm of this *Magistery* or

Precipitate is mixed with Four ounces of Water, or in an ounce of Pomatum. It softens the skin very much, and is also good against the Itch, because it feeds upon those *Acids* or *Salts* that cause this Disease.

C H A P. V.

Of Lead.

Lead is a Metal fill'd with Sulphur, or a Bituminous earth, that renders it very supple and pliant. It hath Pores very like those of *Tinn*; it is called *Saturn* by reason of the influence it is thought to receive from the Planet of that name.

It is good to assuage the heats of *Venus*, being applied to the *Perineum*; it is also applied on many Tumours caused by too great an Ebullition of the Blood.

Calcination of Lead.

Melt *Lead* in an earthen Pot unglazed, and stir it over the Fire with a *Spatule* 'till it is reduced into powder. If you increase the Fire, and still *Calcine* the Matter for an hour or two,
it

it will be more open and fit to be penetrated by Acids.

If you put this Powder to Calcine in a Reverberatory Fire for three or four hours, it will be of a red colour, and is that which is called *Minium*.

Lead is also prepared into *Cerusse* or *White-Lead* by the means of Vinegar, whose vapour it is made to imbibe; for it turns into a White Rust, that is gather'd up, and little Cakes made of it.

I spoke of the way of reducing *Lead* into *Litharge*, when I treated of the Purification of Silver by the *Coppel*, and it is thither I desire my Reader to return.

Salt of Saturn.

Take three or four pounds of one of these Preparations or *Calcinations* of *Lead*, for example the *Cerusse*: powder it, and put it in a large Glass or Earthen vessel; pour upon it distill'd Vinegar four fingers high, an Ebullition will follow without any sensible heat. Put it in Digestion upon hot Sand for two or three daies, stirring about the Matter ever now and then; then let it settle, and separate the Liquor by Inclination. Pour new distill'd Vinegar upon the *Cerusse* that remains in the Vessel, and proceed as before, continuing to pour on distill'd Vinegar, and separate it by Inclination, until you have dissolved about half the Matter. Mix all your

Impregnations together, in an earthen or glass Vessel. Evaporate over a Sand-fire with a gentle heat, about two thirds of the moisture, or 'till there rises a little skin over it. Then transfer your Vessel into a Cellar or some such cool place, without jogging it; there will appear White Crystals, which you must separate, and Evaporate the Liquor as before, and set it again in the Cellar. Continue your Evaporations and Crystallizations, 'till you have gotten all your Salt. Dry it in the Sun, and keep it in a Glass.

If you would make it extreme white, you must dissolve it in equal quantities of Distill'd Vinegar, and common Water, then Filter it, and Crystallize it, as I said before. This Purification may be repeated three or four times.

It is ordinarily employed in *Pomatus*, for Tettars and Inflammations: the Impregnation of Saturn is also used chiefly for Diseases of the skin; when it is mixed with a great deal of Water, it makes a Milk that is called *Virgin's Milk*.

The *Salt of Saturn* taken inwardly is esteemed very good for the Quinsie, to stop the flowing of the Terms and Hemorrhoids, and for the Bloody Flux. The Dose is from two grains to four in Knot-grass, or Plantain Water, or mixt in Gargarisms.

Remarks.

I commonly make use of *Cerusse* for preparing the Salt of *Saturn*, because I find it to be
more

more open, and easier to dissolve, than the other Preparations of *Lead*, by reason of the Vinegar it is already impregnated with.

The Ebullition, that is observed, doth proceed from the violent entrance of the Acids, that forcibly separate the parts of the Matter. But it is remarkable that the Effervescency which happens upon pouring a like quantity of Acids on any other preparation of *Lead*, is a great deal stronger; because when the Acid meets with a body not so open as *Cerusse*, it must use greater endeavour to enter into it, and consequently raises up the Matter higher.

In these Effervescencies as well as many others, you cannot perceive the least Degree of Heat, nay some presume to say that Cold is increased in them. Vinegar loses all its force in the penetration of *Lead*, and acquires a kind of sweet or sugar'd taste.

You must not imagine that a true *Salt of Lead* can be drawn. It is nothing but a dissolution of its substance by Acids, which do very closely unite with it, to make a kind of Salt. For if by Distillation you should draw off the humidity of the Dissolution, you'd find it to be nothing but an Insipid water, and consequently deprived of all its Acids. I shall prove that better hereafter, when we come to revive our Salt into *Lead*.

This *Salt* called *Sugar* by reason of its sweetness is good for many Diseases that are caused by Acid or sharp humors, because it asswages them, and mitigates their keenness. This is particularly observed in *Quinzies*, whose cause doth ordinarily

narily proceed from a salt or acid serosity, that falling too abundantly on the *Muscles* of the *Larynx* raises a fermentation that dilates their *fibers*, and causes the Inflammation we see. So whatsoever is able to dull the edge of Acids is good for the cure of this Disease.

Menstrual purgations, Flux of the Hemorrhoids and Dysenteries are usually caused by sharp corrosive Salts that run into the Vessels. Wherefore the *Salt of Saturn*, as all other matters that absorbe Acids, serve to cure these distempers; for take away the cause of a disease, and the effect will soon cease.

Magistery of Saturn.

Dissolve two or three ounces of the *Salt of Saturn* well purified, as I said before, in a sufficient quantity of Water, and Distill'd Vinegar, filter the dissolution, and pour upon it drop by drop the Oyl of Tartar made *per Deliquium*, it will first turn into a Milk, then a kind of *Coagulum*, that will precipitate to the bottom of the Vessel in a white powder. Boil it a little, and pour it into a Funnel lined with a Coffin of brown Paper, the Liquor will pass through as clear as Water, and the Powder remain in it: Wash it several times with Water to carry off all the impression of Vinegar. Then dry it, and you'll have a very white *Magistery*, that is used for a *Fucus* like the *Bismuth*. It is likewise mixed in *Pomatus* for Tettars, &c.

Remarks.

Remarks.

You must put an equal quantity of Water and Vinegar for the dissolution of the *Salt of Saturn*.

The Oyl of Tartar, or rather the Salt of Tartar dissolved being an Alkali destroys the Points of the Vinegar that suspended the Lead, whence it comes to precipitate; for finding nothing in the Liquor that is able to with-hold it, it falls down by its own weight.

This Powder being washt and dried is nothing but a *Cerusse* rendred exceeding fine. It is used indeed for Paint, but this *Cosmetick* as well as all others that are made of Metallick substances, such as *Tinn* and *Bismuth*, do often black the skin after having whitened it, because the heat of the flesh doth gather together these Metallick Particles, which owned all their whiteness to an exact Alkoholisation, and losing that, do often Revive.

Balsam or Oil of Saturn.

Put eight ounces of *Salt of Saturn* powdered into a Matrafs, and pour upon it the Spirit of *Turpentine*, four fingers above it, place the Matrafs in a small Sand-fire digesting for a day, you'll have a red Tincture; separate the Liquor by inclination, and pour more Spirit of *Turpentine*
on

on the Matter that remains in the bottom of the Matrafs, leave it in digestion as before, then separate again the Liquor a little coloured still, there will remain at the bottom nothing but a little Matter, that you may Revive into Lead in a Crucible over the fire. Pour your dissolutions into a Glas-Retort, place it in Sand, and fitting to it a Receiver, distill over a gentle fire about two thirds of the Liquor, which will be the Spirit of *Turpentine*: quench the fire, and when the Retort is cold pour that which is in it into a Viol, and keep it for use. This is the *Balsam of Saturn*, excellent for cleansing and cicatrizing of Ulcers. You may touch Chancres with it, though they be never so bad, for it mightily resists putrefaction.

Remarks.

The Spirit of *Turpentine*, to speak properly, is an exalted Oyl. It dissolves Lead, and easily unites with it, because it is very sulphurous.

If you should still persist in putting new Spirit of *Turpentine* on the remaining matter, all the *Salt of Saturn* would at last dissolve.

Some do use to distill away all the Liquor, and keep that for Oyl which comes forth last. But it is a great deal better to follow my description; for when all the Liquor is distilled, there will hardly have risen any Particle of *Saturn*, and therefore it cannot be so good.

Burning

Burning Spirit of Saturn.

Fill two thirds of an earthen Retort, or a Glass-one luted, with the *Salt of Saturn*; place it in a Furnace over a very gentle fire, both for gently heating the Retort, and driving out a Phlegmatick Water; continue this degree of Fire, until the drops begin to have some taste, then fit to the Retort a large Recipient, lute well the junctures, and encrease the fire by degrees, a Spirit will come forth that will fill the Recipient with Clouds. When nothing more will come, let the Vessels cool, and having unluted them, pour what you find in the Recipient into a Glass-Cucurbite, and rectifie in a very gentle Sand-fire about half the Liquor, which will be the *inflammable Spirit of Saturn*, burning like the Spirit of Wine, and of a sour taste.

This Spirit is very good to resist the putrefaction of humours: It is also given in the Hypochondriack Melancholy from eight unto sixteen drops in Broth, or some Liquor peculiar to the Disease, and the use of it is continued every Morning for a Fortnight.

If you take out the blackish matter that remains in the Retort, and put it in a Crucible upon burning Coals, it will reassume the form of Lead.

Remarks.

Remarks.

You must remember not to fill above two thirds of the Retort with the Salt, and to joyn a Receiver large enough, because these Volatile Spirits flying out with violence might be apt to break the Vessels, if they had not room to play in.

The *Spirit of Saturn* becomes inflammable from its containing in it some spirit of Wine, that remains still involved in the Vinegar, and was carried away with the Acids into the pores of Lead, when the *Salt of Saturn* was made; for if you quicken the Fire to distill this Salt, the Acids break in pieces, and leave the Spirit of Wine at liberty, so that the Spirit of *Saturn* hath no Acid taste.

The matter that remains in the Retort after the Operation may be easily revived into Lead, as being deprived of the Acids which gave it the form of Salt.

The Salt of *Saturn* may be likewise revived into Lead by mixing it with an Alkali Salt melted in a Crucible over a good fire, because this Salt destroys the Acids that kept the Lead thus disguised; but you must observe that it will inflame before it revives, by reason of the spirit of Wine that I said was included in the dissolution of *Ceruse* made by Vinegar.

C H A P. VI.

Of Copper.

C*opper* is a Metal that abounds in Vitriol and Sulphur, it is called *Venus*, because this *Planet* was thought to govern it particularly, and bestow its Influences upon it : and for this reason there hath been attributed unto it the virtue of encreasing seed, and curing the diseases of those parts that serve for Generation.

Calcination of Copper.

Stratifie plates of *Copper* with powder'd Sulphur in a large Crucible, cover the Crucible with a Cover that hath a hole in the middle, to give the Vapours a vent. Place your Crucible in a Wind-furnace, and light a very strong fire about it, until there rise no more vapours ; then draw off your Plates as they are hot, and separate them, this is the *Æs ustum* that is used in outward remedies to deterge.

Remarks.

Remarks.

In the making of this stratification we begin with a bed of Sulphur, and lay over it a bed of Copper-plates, then another bed of Sulphur, and another of Plates. We continue to do so till the Crucible is quite full; but you must be sure to let the first and last bed be of Sulphur. This Calcination is thus performed, that the common Sulphur by its burning may cleanse the Copper of its superficial Sulphur; but it will become much better purified by the following Operation.

Purification of Copper.

Take what quantity you please of *Calcined Copper*, heat it red-hot in a Crucible between the burning coals, and cast it red-hot into a Pot, wherein you shall have put enough Oyl of Lin-seed to swim above it four fingers; cover the Pot presently, for otherwise the Oyl would take fire, let the Copper steep, till the Oyl is grown pretty cool, separate it, and put it to heat again in the Crucible, then cast it into Oyl of Lin-seed; continue to make it red-hot, and quench it in the Oyl for nine several times. You must change your Oyl every third time; you'll have a *Copper* well purified, and of its former colour. If you Calcine it once again, to consume the Oyl, and powder

powder it, you'l have a *Crocus of Copper*, that is deterfive and good to eat the proud flesh of Wounds and Ulcers.

Vitriol of Copper or Venus.

Dissolve two ounces of *Copper* cut into little pieces in five or six ounces of the *Spirit of Niter*, pour the dissolution into a *Glass-Cucurbite*, and evaporate in a *Sand-fire* about the fourth part of the *Liquor*; put that which remains into a *Cellar*, or some other cool place, and let it lye there five or six Hours, you'l find *Blew Crystals*, separate them, and continue to evaporate and crystallize, till you have drawn them all; dry these *Crystals*, and keep them in a *Viol* well stopr.

They are *Caustick*, and are used to consume superfluous or proud flesh.

If you leave these *Crystals* in a *Pan* uncover'd, they will turn into *Liquor*, that may serve for the same use.

Remarks.

The *Vitriol of Copper* is nothing but the *Acids* of the *Spirit of Niter* incorporated in the *Copper*; and it is these *Spirits* that cause all the *Corrosion*; for they are like so many little *Knives* fastned to the *Body* of the *Copper*, which do tear and gnaw the flesh on which they are applied. This *Vitriol* dissolves into *Liquor*, because the
Copper

Copper having large Pores the moisture doth easily insinuate into them.

Other Crystals of Venus.

Take what quantity you please of *Verdegrease* in powder, put it into a large Matrafs, and pour upon it Distilled Vinegar four fingers above it. Place the Matrafs in Digestion in hot Sand, and let it lye so three days stirring it ever now and then, the Vinegar will acquire a blew colour; separate by Inclination the Liquor that swims over the Copper, and pour new Distilled Vinegar upon the matter, leave it in Digestion for three days as before, separate by Inclination the Liquor, and continue to put other Distilled Vinegar on the matter, until three fourths of the *Verdegrease* or thereabouts be dissolved, and there remains nothing but a terrestrious matter. Then Filter all these Impregnations, and evaporate two thirds of the moisture in a Glass-Cucurbite in a Sand-fire; put the Vessel into a Cellar, and leave it there without stirring it for four or five days: little *Crystals* will appear, separate by Inclination the Liquor, and gather them up; consume again about the third part of the moisture, and put it a Crystallizing as before; continue these Evaporations and Crystallizations, till you have got all your Crystals, dry them, and keep them for the following Operation.

Remarks.

Remarks.

You had better use *Verdegrease* than crude *Copper* in this Operation, because it is more open, and disposed for dissolution by the Acids of *Vinegar*; for *Verdegrease* is nothing but *Copper* penetrated, and rusted by the fermenting spirits of *Tartar*.

For the making of *Verdegrease*, Plates of *Copper* are *stratified* with the husks of *Grapes* pressed. They are left so for some time, and part of these Plates is turned into *Verdegrease*, which is scraped off with a Knife; then these same Plates are *stratified* again with pressed *Grapes*, and are penetrated as before, and more *Verdegrease* made. This stratification is continued until they are quite turned into *Verdegrease*. You must observe that *Verdegrease* is better made in *Languedock* and *Provence* than other places, because in those Countries the *Grapes* do yield more *Tartar*, and consequently do abound in these fermenting Spirits, which do penetrate the *Copper*.

The *Crystals of Venus* are nothing but *Copper* dissolved, and afterwards coagulated with the Acids of *Vinegar*, that incorporate with it, and forme a kind of *Vitriol*.

Spirit of Venus.

Put what quantity you please of the *Crystals* of *Venus* prepared with distill'd Vinegar, as I shewed before, into a glass Retort, whose third part remains empty. Place your Retort in Sand, and fitting to it a large Receiver, and Luting well the junctures, give a small Fire at first, to drive out a little insipid Phlegm, this Phlegm will be followed by a Volatile Spirit. Then augment the Fire by degrees, and the Receiver will fill with white Clouds. Towards the latter end kindle coals round about the Retort, that the last Spirits may come forth, for they are the strongest. When you see the clouds disappear, and the Recipient grow cool, put out the Fire: unlute the junctures, and pour all that which is in the Recipient into a Glass Cucurbite to distil it in Sand unto exsiccation.

This Remedy is used against the Epilepsie, the Palsie, and the Apoplexie, and other Diseases of the Head. Seven or Eight drops of it are given in a convenient Vehicle: many do use it to dissolve Pearls, Coralls, and such like substances.

The black Mass that remains in the Retort may be revived into Copper, if put in a Crucible in a Fire of *Fusion*, with a little Salt-peter, or Tartar.

Remarks

Remarks.

An Acid is drawn away from Copper without breaking its points, for the *Spirit of Venus* is considerably sharp, which happens not in other Metals. The reason that may be given of it is, that Copper, which is very full of Sulphurs, doth but barely touch upon the Acids by its remote parts. So that when these points are stirred by the violence of Fire, they come forth whole, because they do not meet with resistance of a body hard enough to break them in pieces. They do also draw along with them, some of the most Volatile parts of Copper, with which they are inseparably united.

It hath been thought that this Spirit being poured upon Coralls and Pearls was able to dissolve them without losing any thing of its force; so that when you would use the same Spirit, it would corrode the Matters as before. But Experience doth not confirm it; it is true the dissolvent comes from the Coral with a great deal of sharpness, but it hath lost the Acidity which was the principal *Menstruum*; and if there remains any sharpness, it proceeds from the Copper.

C H A P. VII.

Of Iron.

Iron is called *Mars* from the Planet of that name, whose Influence it is thought to receive; it is a very porous Metal compounded of a Vitriolick Salt, of Sulphur, and Earth ill digested together; wherefore the dissolution of its parts is very easily performed. It is turned into *Steel* by means of Horns or Nails of Animals, with which it is stratified, and so Calcined. These matters containing a great deal of Volatile Salt which is an *Alkali*, do kill or destroy the Acids of the *Iron*, that kept its Pores open, and do render it more compact. Besides the Fire carries off many of the more Volatile and Soluble parts of *Iron*, whence it comes to pass, that *Steel* will remain longer without rusting than *Iron*.

Steel is to be preferred before *Iron* for the making of *Utenfils*, but for *Remedies*, *Iron* is the better beyond comparison. I shall give you the reasons for what I say in the following Operations.

Opening Saffron of Mars.

Wash well several *Iron Plates*, and expose them out in the Dew for a good while, they will rust,

rust, and you must gather up this Rust. Set the same Plates again to receive the Dew, and gather the Rust as before. Continue to do so till you have gotten enough.

This Rust is really better than all the Preparations of *Iron* that are called *Crocus*. It is excellent for Obstructions of the Liver, Pancreas, Spleen, and Mesentery.

It is used very happily for the Green-Sickness, stopping of the Terms, Dropsies, and other Diseases that proceed from Oppilations. The Dose is from two grains unto two Scruples in Lozenges or Pills. Many do give *Mars* with Purgatives, which is a good sort of Practice.

Remarks.

Chymists have called Calcin'd Steel *Crocus*, by reason of its red colour; and they have given this name to many other Preparations for the same reason.

Though *Steel* hath been always used in Chymical Preparations that are used in Physick, and is preferred before *Iron* for the Cure of Diseases; it is certain nevertheless that *Iron* is fitter for that intent than *Steel*, seeing it is more Soluble; for if the action of *Iron* proceeds from nothing but its *Salt*, as there is no reason to doubt, the Salt of *Iron* must be much easier separated in the stomach than that of *Steel*, because as I have shewn before the Pores of *Steel* are more close than those of *Iron*, and therefore

this must have quicker effects; besides that Steel being harder to be dissolved doth sometimes pass away with the excrements, without bestowing any impression on the *Chyle*. The reason that hath induced People to believe that Steel is better for use than Iron, was its being thought to be deprived of many impurities by Calcination, but that which is called Impurity is the more open part of the Iron, and consequently the more wholesome.

This Preparation of the *Saffron of Mars* is extraordinary, and longer a doing than the others; but it is the best of all that ever were invented. The Dew is impregnated with a Dissolvent that opens very much the Pores of Iron, and incorporating with it renders it more active and soluble than it was before.

Iron doth open Obstructions by its salt, which being assisted with the solid parts of the Metal, penetrates further than other Salts. But you must always purge and moisten the Person you give it to with broths before you presume to give it, because if it should find the passages of the small Vessels filled and obstructed with gross matters, it stops and sometimes causes Inflammations that create pains like unto those of the Colick.

Many do use the *filings of Steel* without any Preparation at all.

Iron doth frequently open Obstructions by absorbing, as an Alkali, the Acid that nourished them.

Another

Another Aperitive Saffron of Mars.

Put the *filings* of Iron into an earthen Pot unglazed, and expose it to the Rain until it turns into a Paste. Then set it a drying in the shade, and it will rust; powder it, and expose it to the Rain again as before, and so let it rust; continue to rehumectate, and rust this matter for twelve times. Then powdering it very fine keep it for use. You may wet it with the Water of Honey instead of Rain.

This *Crocus* hath the same virtues as the other, and is given in the same Dose. I cannot but prefer that which I described before, because I conceive it to be more open than this.

Another Opening Saffron of Mars.

Take equal quantities of the *filings* of Steel, and Sulphur powdered. Mix them together, and make them into a Paste with Water; put this Paste into an earthen Pan, and leave it a fermenting four or five hours; after which put the Pan over a good fire, and stir the matter with an Iron *Spatula*, it will flame, and when the Sulphur is burnt, it will appear black; but continuing a good strong fire, and stirring it about two hours, it will be of a very red colour, which declares to you the Operation is ended. Let it cool, and this *Crocus* may serve in the same Diseases as the

former ; the Dose is from fifteen Grains to a Drachm.

Remarks.

This Preparation is sooner ended than any of the others that are made by fire.

The Matter is left fermenting four or five Hours, that the Acids of *Sulphur* may penetrate the *Mars*, and render it the fitter to be Calcined ; so that it not only ferments but grows hot of it self, insomuch that you can hardly endure your hand upon it, and it is already half-calcined, when you put it over the fire.

You must observe to make this Calcination rather in an earthen Pan, than Pot or Crucible, and to stir it continually with a *Spatula*, that the *Sulphur* may exhale the more easily. I have sometimes tried to do it in a Crucible, but the Matter still remained black, though I persisted in calcining and stirring it for above twelve Hours together.

If you have used a Pound of *Mars*, you'll get at least a pound and four ounces of *Crocus*, which proves the Acids of Sulphur, or some igneous Atoms to incorporate in the Pores of the Iron, and augment its weight.

The red colour proceeds from Vitriol that *Mars* is full off, which being calcined grows red like *Cholcothar*.

Many other Preparations of *Opening Saffron* of *Mars* have been invented, but these three are sufficient as being the best.

Binding

Binding Saffron of Mars.

Take what quantity you please of the last *Aperitive Saffron of Mars*; wash it five or six times with strong Vinegar, leaving it to steep an Hour at a time, then calcine it in a pot, or upon a Tile in a great Fire five or six Hours; after that let it cool and keep it for use.

It stops the *Diarrhœa*, the immoderate flowing of the Hemorrhoids and Terms; the Dose is from fifteen grains to a drachm in Lozenges or else in Pills.

Remarks.

Because *Mars* is an impure *Vitriol*, the more it is Calcined, the more astringent it is. But seeing that which renders it Aperitive is its Salt, or more soluble part, I intend by washing it several times with Vinegar to deprive it of much of its Salt. Afterwards I Calcine the matter to carry off by fire what aperitive parts might remain.

Several other Preparations for making the *Astringent Saffron of Mars* are taught, but this one may suffice.

Vitriol

Vitriol of Mars.

Take a clean Frying-pan, and pour into it an equal weight of the *Spirit of Wine*, and *Oyl of Vitriol*; set it for some time in the Sun, and then in the shade without stirring it; you'll find all the Liquor incorporated with the *Mars*, and make a salt that you must dry, then separate it from the Pan, and keep it in a Viol well stopd.

It is an admirable Remedy for all Diseases that proceed from Obstructions; the Dose is from four to twelve grains, in Broth, or some Specifick Liquor.

Remarks.

The Spirit of Wine serves here to moderate the too great force of the Oyl of Vitriol, which if alone would in a very little time penetrate all the parts of the Iron, and cause a very impure Salt; but the spirit of Wine hinders its so quick dissolution; so that nothing but the more soluble part incorporates with the Oyl, to make a Salt or Vitriol; for the Salts of Metals or Minerals are all Vitriols.

The Oyl of *Vitriol* is improperly called Oyl, being nothing but the more caustick Spirit, as I shall prove in its proper place.

Riverius in his *Practise* gives a way of preparing the Salt of *Mars* like unto this; excepting that

that he puts more Spirit of Wine than Oil of Vitriol, but it is better put equal parts as I have done.

Its virtue is greater than that of the *Crocus*, because it is whetted by the Oyl of Vitriol, and therefore is given in a less dose; you must observe that sometimes it causes a nauseousness as all Vitriols do.

Another Vitriol of Mars.

Put eight ounces of clean filings of Iron in a large Matraiss, and pour upon it two pounds of common water heated a little; add unto it a pound of good Spirit of Vitriol, stir it, and set your Matraiss on hot Sand, leave it there in Digestion for four and twenty hours, during which time the purest part of the Iron will dissolve; separate the Liquor by Inclination, and fling away the earthy part that remains in a small quantity at the bottom, Filtrate this Liquor, and evaporate it in a Glass-Cucurbite unto a Skin in a Sand-fire, then set your vessel in a cool place, and you'll find green Crystals, that you may take out after having gently poured off the Liquor. Then evaporate again this Liquor unto a Skin, and Crystallize it as before, repeat these evaporations and Crystallizations untill you have got all your Crystals; then dry them, and keep them in a Glass bottle well stopd.

This *Vitriol of Mars* hath the same virtues as the former, and must be given in the same Dose.

Remarks.

Remarks.

The Spirit of Vitriol is weakned by the Water, that it may be incapable of dissolving but only the purer part of *Mars*. Moreover if it were used alone, it would incorporate with the very substance of *Mars*, but would not be able to dissolve any of it, because there would be wanting sufficient moisture to separate the parts.

To *Evaporate* unto a *Pellicule*, doth signifie to consume the Liquor untill a kind of thin skin is perceived to swim upon it, which always happens when some part of the moisture being evaporated there remains but little more than is necessary to hold the Salt in *Fusion*.

An Acid Spirit may be drawn from this *Vitriol of Mars* by distilling it in a Retort in a Reverberatory fire, like common Vitriol; this Spirit hath the same virtues as the ordinary Spirit of Vitriol. That which remains in the Retort after the Distillation is an *Opening Saffron of Mars*.

Tincture of Mars with Tartar.

Take Twelve ounces of the *Rust of Iron*, and Two pounds of *White Tartar of Montpellier*, powder and mix them together; then boil them in a great Kettle or Iron Cauldron with Twelve or Fifteen pints of Rain-water for Twelve hours time, stir the matter with an Iron Slice from

from time to time, and take care to put more boiling water into the Cauldron, according as it consumes; afterwards leave it a while to settle, and you'll have a black Liquor, Filtrate and evaporate it in an Earthen Pan over a Sand-fire, to the consistence of a Syrup, or till there rises a Pellicule over it.

It is a very great Aperitive, it opens the most inveterate Obstructions, and is given in Cachexies, Dropsies, Obstruction of the Terms, and other Diseases that proceed from Oppilations; the Dose is from a Drachm to Half an ounce in Broth, or some appropriate Liquor.

Remarks.

In this Operation I chuse rather to use the *Rust of Iron* than *Filings of Steel*, because it is more open, and easie to be dissolved, for this *Tincture* is properly a *Dissolution of Mars*.

Water alone would not be able enough to penetrate the Iron, for to make a *Tincture*, though you should boil it a Month together. But when it is impregnated with *Tartar*, it dissolves it very easily.

After the *Tincture* is drawn, there remains a White matter, that you must fling away as good for nothing: it is a mixture of the grosser parts of *Tartar* and *Mars*.

This *Tincture* is called *Syrup of Mars*, by reason of a certain sweetness that is perceived in its Taste. It is reduced into the consistence of a Syrup, to keep the better. As

As for its virtues, 'tis a very great Apeitive, because the force of *Mars* is assisted by the Tartar, that serves to be its Vehicle. It may be said also to sweeten the Acid humour that was the cause of Oppilations; for *Mars* is an *Alkali*.

Opening Extract of Mars.

Take Eight ounces of the *Rust of Iron* made by the Mornings Dew, put it in an Iron Pot, and pour upon it three pounds of the Water of Honey, and four pounds of Must, or the juice of White grapes perfectly ripe. Add to it Four ounces of the juice of Lemons; cover it with an Iron Cover, and set it in a Furnace over a little fire; leave the Matter in Digestion for three days time, then boil the Matter gently for three or four hours, uncovering the pot ever now and then, to stir up the bottom with an Iron slice, then covering it again, that the moisture may not evaporate too fast. When you perceive the Liquor to be black, you must take away the fire, and leave it a while to settle, pass warm through a cloth that which is clear, and evaporate the moisture in a Sand fire, in an Earthen pan, or Glass vessel to the consistence of an *Extract*. 'Tis a very good aperitive; it hath the same virtues as the Tincture for Obstructions of the Liver, Spleen, and Mesentery; it delivers the Lymphatick vessels admirably well of what may hinder their current. The Dose is from Ten grain to two Scruples, in Pills, or else dissolved in

in some proper Liquor. That which remains in the bottom of the Iron Pot is the more Earthy part of *Mars*, that is good for nothing.

Remarks.

This *Extract* doth not receive its consistence only from the Iron, but from the Tartarous juices of the Grapes and Lemons, with which it is mixed; its virtue is augmented by the Essential Salts, and the Spirit of Honey that leaves in it a very good impressi^on.

The mixture is left in digestion, for the better Dissolution of the *Mars*; but seeing the *Menstruum* is not very sharp or corrosive, it dissolves only the more Salt and soluble parts. This Description is not common, but may be preferred before many others.

Every Body grants that *Mars* is as excellent a Remedy as any in all Physick, for opening Obstructions, and restoring a good complexion to those that want it by reason of Obstructions; but you must not be contented with giving it once or twice, but for a fortnight together; some intervals may be observed, that nature may not be troubled too much. In hot climes such as *Languedoc* and *Provence*, where are more Oppilations than in other Countries, they make no difficulty in taking it sometimes every day for a month together, after a due Preparation, and it is the best Remedy that hath been known for that Distemper.

Binding

Binding Extract of Mars.

Take Eight ounces of the *Rust of Iron* powdered very fine, put it into an Iron pot, and pour upon it four pounds of a deep Red wine, that is called *Wine to Colour with*; set the pot over the fire, and having covered it, make the Matter boil, stir it from time to time with an Iron slice, till two thirds of it be consumed; pass the Liquor warm through a cloth, and evaporate it to the consistence of an *Extract*. It stops the Looseness, Bloody Flux, the Flux of the Hemorrhoids and Terms, the Dose is from Ten Grains unto Two Scruples in Pills, or dissolved in some astringent Liquor.

Mars Diaphoretick.

Powder and mix together equal quantities of the *Rust of Iron*, and *Salt Armoniack*, put this mixture into an Earthen Cucurbite, set it in a small Furnace, and stop up the bottom with Lute and Bricks, that the fire may not be able to pass upwards, but only through certain holes or Registers; fit to your Cucurbite a Blind head, and give a gentle fire at first; augment it by degrees to heat the Cucurbite red-hot, and continue this degree of heat, until there arise no more vapours; then let the vessels cool, and taking off the Head gather the sublimed *Flowers*, dissolve them

them in water enough only to dissolve them, Filtrate this dissolution through a Coffin of brown paper, and pour upon it drop by drop the Oyl of Tartar made *per Deliquium*, or else the Spirit of Salt Armoniack, a powder will precipitate to the bottom of the vessel, separate by Inclination the Liquor above it, and dry this *Precipitate*; it causes Sweat, and is good against all Diseases that proceed from a corruption of Humors; it sometimes also drives by way of Urine, according as the bodies are disposed: it is excellent against the Hypochondriack Melancholy, and Quartan Agues: the Dose is from Ten to Twenty Grains in Pills, or some proper Liquor.

Remarks.

This Preparation is Sudorifick by reason of some particles of Salt Armoniack that remain in the Precipitated *Mars*; for when these Saline parts are actuated by the heat of the Body, being of a very Volatile nature they do insensibly distribute themselves rather into the Pores of all the Body, than follow the course of fixt Salts by way of Urine; whence a Sweat does follow, or sometimes an insensible transpiration, because it rarifies and gives vent to abundance of Humors that were not able to pass away by reason of their viscosity. Sometimes also finding the Pores too much obstructed, it is forced to become fixt, and follow the ordinary course by way of Urine, and then it opens the *Lymphatick*
G
Vessels,

Vessels, and evacuates several matters that were contained in them.

People find greater benefit from much *Urine* than *Sweat*, because the way of *Urine* is more natural and weakens less.

CHAP. VIII.

Of Mercury.

Q*uick-Silver* is a prodigy among Metals; for though it is very heavy, yet it easily flies away, when set upon the fire. The reason of it may be this, that the Pores of this mixt are configurated after such a manner that the particles of fire not being able to penetrate it, do carry it away by their activity.

It is called *Quick-silver* from its fluidity, and *Mercury* because it changes into different shapes, like the *Celestial Mercury*, from whom it is thought to receive its Influence.

It is to be found in many places of *Europe*, as *Poland*, *Hungary*, and even in *France*; for a few years since there was discovered near *St. Lo* in *Normandy*, a Mine abounding in *Cinnabar*, from whence good store of *Mercury* is drawn.

Some of it is also found running in the Mines, and this is passed through a Shammey skin to purifie

purifie it from some Earth that it is joyned with; and because it doth sometimes prove very difficult to separate it from Earths with which it is in a manner incorporated, they are forced to distil it through Iron Retorts into Recipients filled with water.

Natural Cinnabar, called *Mineral*, is a mixture of *Mercury* and *Sulphur* that sublime together by the means of a Subterraneous heat, and this is done near after the same manner as *Artificial Cinnabar* is made, of which I shall speak anon.

Quick-silver by reason of its fluidity is hard to transport, wherefore good store of it is reduced into *Cinnabar*, on the places whence it is drawn, after the manner following.

Artificial Cinnabar.

Take a quantity of *Sulphur*, and melt it in a great earthen pan, then mix by little and little thrice as much *Quick-silver*; you must stir about and preserve the Mater in *Fusion*, till none of the *Mercury* appears any more. Then powder your mixture, and sublime it in pots over an open fire well managed, you'll have a hard Mass of a very red colour. If any heterogeneous Metal should have been mixt with the *Mercury*, it will remain at the bottom of the Pots.

Besides the convenience of easily transporting *Mercury* by this means, it is very useful in Painting. It is also used in *Pomatus* for the Itch, and to make Fumes to raise a Flux.

Reviving of Cinnabar into Quicksilver.

Take a Pound of *Artificial Cinnabar*, powder it, and mix it exactly with three pounds of Quicklime also powdered; put the mixture into an earthen or glass Retort, whose third part at least remains empty. Place it in a Reverberatory Furnace, and after having fitted to it a Recipient filled with Water, give your fire by degrees, and at last encrease it to the height, the *Mercury* will run drop by drop into the Recipient; continue the fire until no more will come forth, the Operation is commonly at an end in six or seven Hours. Pour the Water out of the Recipient, and having washed the *Mercury* to cleanse it from some little portion of earth it might carry along with it, dry it with Linnen, or the crum of Bread, and keep it for use.

You must draw thirteen ounces and a half of flowing *Mercury* out of each pound of *Artificial Cinnabar*.

Remarks.

When *Mercury* is thus revived, you may be sure of its purity, because if any Metal should have mixed with it in the Mine, it would remain, as I have said, at the bottom of the pot you sublime it in.

The cause of this disguise of *Mercury* in *Cinnabar*

naber proceeds from this, that the more Acid part of Sulphur penetrates the *Mercury*, and fixes its parts after such a manner that it quite hinders the agitation they were in before. Now being driven by the Fire, it sublimes as it is wont to do; but the Saline or Acid Spirits of Sulphur, do so fix or retain it, that it is forced to lose its volatility, and remain in the upper part of the Pot, and this is called *Subliming*. When it is alone, or with any matter that is not able to fix it, it evaporates quite away. *Cinnabar* then is nothing but a mixture of *Acid Spirits* and *Mercury* together; thus if you mix it with some Alkali, and drive it upwards by fire, the Acids, for the reason I have already spoken of concerning Silver, must leave the Bodies they were joyned to before, for to enter into the Alkali; and this is what happens here, for the Acids finding the Quick-lime very porous, do leave the *Mercury*, and adhere to the Quick-lime; so that this *Mercury* being disengaged from what held it fixt before, and driven by the fire, comes forth of the Retort in form of Spirit, but the coolness of the Water that is in the Recipient, condenses it, and resolves it into *Quick-silver*.

A third part of the Retort is left empty, because the rarified *Mercury* comes forth with such violence as would otherwise be apt to break the Retort.

Quick-silver is one of the greatest remedies we have in Physick, when it is used as it should be, but is full as dangerous, when it happens into the hands of *Quacks*, who use it upon all occasions

cations for all sorts of Diseases, and give it indifferently to all sorts of persons without any respect to the Temperament they are of. Those who draw it out of Mines, or work much with it, do often fall into the Palsie, by reason of Sulphurs that continually steam from it; for these Sulphurs consisting of some gross parts do enter through the Pores of the Body, and fixing themselves rather in the Nerves by reason of their coldness, than in the other Vessels, do stop the passage of the Spirits, and hinder their course.

Mercury is given in the Disease called *Misere-re*, unto two or three pounds, and is voided again by siege to the same weight; it is better to take a great deal of it than a little, because a small quantity might be apt to stop in the circulations of the Guts, and if some Acid humors should happen to joyn with it, a *Sublimate Corrosive* would be there made; but when a large quantity of it is taken, there's no need of fearing this Accident, because it passes quickly through by its own weight.

Mercury mixes so well with rosinous and fat Bodies, as to remain imperceptible, and wholly disappear; all *Unguent*s, *Pomatus*s, and *Plasters* in which it enters, are good against the Itch, and Tetters, and do dissolve cold tumours, because it opens the Pores, and drives by perspiration. Furthermore, seeing these Distempers are nourished by Acid humours, it breaks their edge, and hinders them from causing any further Fermentation.

Hitherto there is no Remedy found out to be
so

so soveraign for the cure of Venereal Maladies, as *Mercury*; wherefore its greatest enemies have been forced to flye to it, after they had tried a long time to no purpose to drive out the poison by other Remedies. And in truth if we knew any milder ones that were able to terminate the Accidents of the Pox as well as this does, 'twould argue much rashness to make use of *Mercury*, because it is not always conducted according to our desires, and sometimes very scurvy consequences do happen upon it; but we know no other that can be esteemed to approach it in virtue for all Venereal Diseases, and especially the Universal Pox. It is killed in Turpentine, then with Suet an Ointment is made of it, that serves to rub the parts of the Body, and particularly the joynts, several days together, after the Patient hath been prepared, by Baths, Broths, and Purges. The Friction is continued until the Salivation rises, which is caused by a great many Chancres in the mouth; for these Chancres by an exceeding great acrimony do open extraordinarily the salivating Vessels, and give way to a trickling phlegm, that runs down abundantly. A Flux is also raised by applying *Mercurial Plasters* upon all the Body, and also by *Fumigations* by making one receive the Fumes of *Mercury*. Again it is raised by taking inwardly *white Precipitate*, or some other Mercurial Preparations, without using it outwardly; Let us now come to reason a little upon it.

The effect of *Mercury* hath puzzled almost all Chymical Philosophers; and those Moderns who

have explicated with much probability and likelihood many other Natural things that lay hid to our Forefathers, have declared those of *Mercury* to be some of the most difficult. I know very well that several Persons governed by false Principles, have not forbore to give us their Explanations; but when their Discourses come to be examined by Chymistry, which alone is able to give us Demonstrations on this matter, they presently fall away to nothing. I shall therefore venture to give you a Thought of mine, that seems more probable than any thing I ever met with, and is maintained by Chymical Experiments.

You must first take notice, and it is a thing indisputable among all Physicians, that the Nodes, Tumours, and other effects of the Venereal Poison are fomented by Salt or Acid humours which make a certain Ferment, and that this disease can by no means be cured, until this Poison is quite destroyed. This being supposed, we must examine the nature of *Mercury*, and see what will become of it, if we mix it with Salts or Acids. I have said that *Mercury* is a Volatile, and we shall find hereafter that in the making of *Sublimate Corrosive*, *Mercury* is mixed with *Salt* and *Vitriol*, which are Acids; that upon encreasing the Fire, the Spirits adhering unto *Mercury*, which is an Alkali, do sublime along with it to the top of the Vessel, and make together that which is called *Sublimate Corrosive*; Let us now see in the cure of the Pox, how *Mercury* is used.

It

It is mixed, as I have said, with Suet, and with this Unguent the parts of the Body are rubbed a long time, that *Mercury* may pierce and enter through the Pores; and this it comes to do, as every Body must grant; this hapning, there's no contradiction at all in thinking that one part of it mixes with the Saline or Acid Ferment of the venereal matter, after the same manner, as it doth with *Salt* and *Vitriol*.

The Acid Salts of the venereal Poison fixing in the Pores of *Mercury*, which is, as I have said, a volatile Alkali, do sublime upwards together, being driven by the heat of the Body, up unto the Head, which is the top of the vessel, and the coolest, and so most proper to condense them.

At the same time it is that the Head swells, and the inside of the Mouth is full of Chancres, which cause a pain much like unto that one should receive, if *Sublimate Corrosive* were applied some time upon an excoriated part. Moreover the *Salivating Vessels* being prickt and corroded with this sharp humour, do loosen, and let fall Phlegm that trickles extreamly, and this causes the involuntary Salivation, that uses to accompany these Chancres, and remains sometimes a longer, sometimes a less time, according as these Chancres are more or less acrimonious; for the Phlegm trickling down continually, cleanses them from their keen Salts, and mitigates their pain, whence it comes to pass that they are often cured of themselves, and then the *Salivating Vessels* closing up again, the Flux doth cease.

It

It sometimes happens, when a Man is not well prepared to receive a Flux, or it is raised too soon; that the Sublimation being made too violent, some part of the *Sublimate* sticks to some one or more of the vessels, and corroding their membrane, causes grievous Hemorrhagies, as I have seen to happen several times, and among others to one of *Langnedock*, who voided in half an Hours time twelve Pounds of Blood by the Mouth, without dying of it notwithstanding, because he was a very stout lusty Man.

As for what may still remain of the venereal Poison, after the Salts are driven out, its dissolution is then a very easie business, because nothing but those Salts was able to hold it coagulated; so that it is easie to conceive, that the subtler part of it passes through the pores, and the more terrestrious precipitates, and evacuates by way of Urine.

Perhaps you'll object, that *Mercury* raises a Flux in Persons who never had such a Disease as the Pox, and who never had any of those tumours that contain Acid Salts; but it is an easie matter to answer, that there is no Man whatsoever, let him be never so sound, but hath store of Salt or Acid humours in his Body; the *Serum* which flows into every part is full of Salt, and all the Ferments that preserve the Oeconomy of Nature, do it by nothing else but Salts or Acids; Now there is no more difficulty in conceiving that *Mercury* joyns with the Acids of a sound Person, than those of an impure tumour: for I don't think that *Mercury* goes immediately and
seeks

seeks out the Acids in the tumours of impure Persons, it must have an understanding to do that; but being rarified and moved by the heat of the Body, it circulates all about till it comes to find a Salt that is able to fix it in some measure, and hinder its motion.

Sometimes this *Mercury* not meeting with salts enough to detain it, passes off by transpiration, and carries along those that were united to it, whence it comes to pass that many have been cured of the Pox without a Flux.

At other times it meets with Alkali salts that force it to quit its hold of these Acids, and then it precipitates downwards, and purges by way of stool, whence it comes to pass that those who have a looseness in the time of their taking *Mercury*, are exceeding hard to receive a Flux.

Upon the same Principle may be given the reason of many other Accidents that follow the use of *Mercury*. But let us see whether any thing of use may be drawn from this Discourse for the cure of venereal Maladies.

Although the Poulains, *Phymosis*, Chancres, Gonorrhœas, and other *Precursors* of the Pox, may be cured without a Flux, yet nevertheless you must not neglect the use of *Mercury*; for these Diseases do contain in them a poison that is not at all different from that of the Pox, but only in that it hath not fermented enough to be rarified and carried away by the Circulation into the Habit of the Body; so that there will remain some Salts that cannot be carried away clear by any thing but *Mercury*, which when given in a
small

small quantity on these occasions, drives only by perspiration or by stool, without a Flux. *Sweet sublimate*, of which I shall shortly speak, is very much used in these Distempers, among other general Remedies.

When you undertake the cure of one in the Pox, you must Bath him a good while, purge, and bleed him for Preparation of the humours, to the end that *Mercury* finding them more fluid, may be able to unite with them the more easily, and so carry them off. This *Mercury* must be administered by little and little at first, afterwards the Dose is augmented according to the strength of the Patient, and when the Jaws begin once to ake, you must give no more, unless it be now and then for continuation of the Flux. They spit commonly three Weeks together, but if it doth not by that time stop of its own accord, you must endeavour to stop it with Deterfive Gargarisms.

It happens sometimes that the Salivating vessels dilate and loosen so extreamly by the Corrosive Salts which caused the Salivation, that they cannot be closed again by any kind of Gargarisme, and then the moisture of the Brain dries up by little and little, and Death is the consequent of all; wherefore you must have a great care of not letting the Flux run too long.

Sublimate

Sublimate Corrosive.

Put a pound of *Mercury revived* from *Cinabar* into a Matrafs, pour upon it Eighteen or Twenty ounces of *Spirit of Niter*: Set your Matrafs upon Sand a little warm, and leave it there until it be all dissolved; pour your dissolution, which will be clear as water, into a glass-vessel or earthen pot, and evaporate the Liquor gently over a Sand-fire, until there remains a white Mass, which you must powder in a glass mortar, and mix with a pound of *Vitriol Calcin'd white*, and so much Salt decrepitated: put this mixture into a Matrafs, whose two thirds at least remain empty; place your Matrafs on Sand, and begin with giving a small fire, which you must continue so for three hours, then encrease it with coals to a pretty good violence, there will arise a Sublimate to the top of the Matrafs; the Operation must be ended in six or seven hours, let the Matrafs cool, then break it, avoiding a kind of Farine or light powder that flies up into the air when the matter is stirred; you'll have a pound of very good *Sublimate Corrosive*, keep it for use.

The red *Scories* that are found at the bottom, must be flung away as unuseful.

This *Sublimate* is a powerful *Escharotick*, it eats proud flesh, and cleanses old Ulcers very well. If half a drachm of it is dissolved in a pound

pound of Lime-water, it turns it Yellow, and makes that which is called *Phagedenick Water*.

Remarks.

When the dissolution of *Mercury* is a making, there appears a great ebullition in the Matrafs with a Red vapour that evaporates; also the heat is so very strong, that one cannot endure to lay ones hand upon it: all this great stir proceeds from the Acids, that meet with resistance in their penetration of this body; for jostling one against another, they heat and break one another in pieces, insomuch that some part of the *Spirit of Niter* being Volatilized doth evaporate away in red clouds, as it uses always to do when it rarifies. When the *Mercury* is all of it dissolved, the dissolution clears up and cools, because the edges of the Spirits are all sheathed in the *Mercury*, whence their motion comes to be interrupted and cease; and this is a thing so true, that if you should distil the humidity of this dissolution, you'd draw off a water that is almost Insipid; there remains a white Mass at the bottom, which is nothing but a *Mercury* loaded with the strongest part of the *Spirit of Niter*.

You might perform this Operation by only mixing crude *Mercury* with Salt and Vitriol, without taking the pains to dissolve it with *Spirit of Niter*, but you would be an intolerable while incorporating them together, so as to make the *Quick-silver* imperceptible. Moreover there
rises

rises up a dust to the Nose that is very inconvenient and unwholsom : that which we do therefore by dissolving it and reducing it into a white Mass is only to prepare it for an easier mixtion.

In the Sublimation I have described, the *Mercury* loads it self with as many Acid Spirits as it is able to contain ; these Spirits are a kind of burthen unto it, and restrain its great Volatility, so that it doth not evaporate as it would do if there were nothing to withhold it, but it only Sublimes to the upper part of the Vessel in fair white Crystals that are called *Sublimate Corrosive* ; the Mass that remains at the bottom of the Matraass is nothing but a mixture of the Terrestrious parts of Salt and Vitriol.

The *Corrosion* of this *Sublimate* proceeds from the Acid points that are fixed superficially in the *Mercury*. Now seeing the smallest heat is able to set them in motion, when *Sublimate Corrosive* is outwardly applied, or given inwardly, some of these small particles slip off from the rest, and corrode, tear, and burn all the places they pass through, whence it comes to pass that if it should chance to be taken inwardly, it kills in a very little time.

If *Sublimate Corrosive* is dissolved in Lime-water, the water presently turns yellow, as is seen in the *Phagedenick water*, and it loses so much of its Corrosive quality, that it may be given inwardly after that without fear of poisoning ; and the reason of it is, that the greatest part of the Acid points strike off from the Sublimate to enter into the *Alkali* of Lime which is

a more porous body; so that *Mercury* losing some of the most keen Acids, becomes less *Corrosive*.

It will not be amiss to acquaint you here, that you'll often meet in the Shops of Druggists with *Sublimate Corrosive* made of *Arsenick*. Now to know the truth of it, you must rub it with a little *Salt of Tartar*, if it turns black, there is *Arsenick* infallibly in it; on the contrary if it turns yellow, 'tis good.

If you dissolve *Sublimate Corrosive* in Water, then Filtrate, and separate the filtered Liquor into two Viols, and cast into one of them some drops of the Oyl of Tartar made *per Deliquium*, you'll presently have a *Red Precipitate*, that you may dry and use. Then if you drop into the other Viol the Volatile Spirit of Salt Armoniack, you'll have a fine *White Precipitate*, of the same virtues with that I shall describe anon.

Sweet Sublimate, called by the French, Aquila Alba.

Powder sixteen ounces of *Sublimate Corrosive* in a Marble or Glass mortar; mix with it by little and little twelve ounces of *Mercury* revived from *Cinnabar*: stir this mixture with a wooden Pestle, until all the *Quick-silver* becomes imperceptible; then put this gray powder into several Viols, or into a Matraass the two thirds empty; place your vessel on Sand, and give but

a little fire at first, then augment it unto the third degree : continue it in this condition until your *Sublimate* is made, which usually happens in four or five hours. Break your Viols, and fling away a little light earth that's found at bottom : separate also that which sticks to the neck of the Viols, or Matrafs, and keep it for Unguents against the Itch, but gather up carefully all the matter that is in the middle, which is very White, and powdering of it Resublime it in Viols or a Matrafs as before ; separate once more the matter in the middle, and Resublime it in other Viols, as before, this third time ; lastly, separate the terrestrious matter at the bottom, and the Fuliginous that lies in the neck of the Viols, and keep the *Sublimate* that is in the middle, for it is sufficiently dulcified. Its use is for all sorts of Venereal Diseases, it opens obstructions, and kills the Worms, the Dose is from six unto thirty Grains in Pills ; it purges gently by Stool.

Remarks.

You must observe never to powder *Sublimatæ Corrosive* in a Mortar made of Metal, because it would corrode it, and carry off some part of it, which would spoil the Operation ; Glass, Marble, and Stone Mortars are more convenient, because they can communicate no ill impression to the matter.

Many have written that we should use equal
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parts of *Sublimate* and *Mercury*, but they did not consider that so great a quantity of *Mercury* could not be here used, and that when the *Sublimate* hath received near about the quantity I have appointed, the rest remains unmixed.

When a *Matrass* is used for this Operation, half its neck must be cut off before-hand; for when it is performed in common *Matrasses*, a great part of the *Fuliginous* matter not being able to rise high enough falls down again on the *Sublimate*, and hinders it from sweetning, because this *Fuliginosity* contains the more acrimonious part, whereas it will easily fly out of *Viols* or *Matrasses* of a short neck. Two thirds of each vessel must remain empty, otherwise the *Mercury*, which rarifies like a Spirit, would be apt to break them. That which sticks to the neck of the *Viols* being too acrimonious to be used inwardly may serve for Ointments against the Itch and Tettars.

It seems a little strange at first that so strong a Poyson as *Sublimate Corrosive* should be reduced into so gentle a Remedy by the addition of nothing but *Mercury*. But you must wonder no longer, when you consider that those Spirits which caused the Corrosion were then shut up in so strait a room, but being now divided and enlarging their quarters, cannot in any reason act with such force; besides that by the repeated action of fire the subtler part of their points becomes blunt against the body of *Mercury*.

The Purgative quality of *Sweet Sublimate* consists in the Acids that remain; wherefore if
you

you should go to Sublime it twice or thrice more, the Sublimate will not be at all Purgative, but only Sudorifick. And it is then more proper to raise a Flux with, for having lost those Salts which by irritating the Stomach and Guts rendred it Purgative, it is the more disposed for rarefaction in the body, and so to joyn with the ferment of Venereal Tumors.

Mercury prepared any way whatsoever should be taken inwardly no other way than in Pills, but by no means in potion, for fear it should stop between the Gums, and so spoil and loosen the Teeth.

White Precipitate.

Dissolve in a Glass-Cucubite a pound of *Mercury* revived from *Cinnabar* with 22 or 24 ounces of *Spirit of Niter*, without setting the Vessel over the fire when the Dissolution is made, pour upon it Salt-water filtred, made of ten ounces of Sea-salt in two quarts of Water; add unto this about half an ounce of the Volatile Spirit of Sal Armoniack, there will Precipitate a very white powder, that you must leave for a sufficient time to fall down in; then having poured off the Water by Inclination, wash it several times with Fountain water, and dry it in the shade. It is used to raise a Flux with, the Dose is from four to fifteen grains in Pills. It is also used in pomatums for Tettars and the Itch from half a drachm to two drachms, for an ounce of Pomatum.

Remarks.

If you desire to make this *Precipitate* exceeding white, you must dissolve the *Mercury* in a Vessel whose Mouth is very large, that so the red vapour of the Spirit of *Niter* may flye out the more easily. When the Dissolution is made without the help of fire, the *Precipitate* is the whiter.

The *Precipitation* of *Mercury* may be made with the Spirit of Salt, as well as the Salt in substance.

It may well seem strange that an Acid Salt, such as Sea-salt, should be able to precipitate that which the Acid of the Spirit of *Niter* had dissolved. To resolve this difficulty, you must conceive that, though our Senses tell us that Acids do all perform the same effect, which is to prick and penetrate, yet nevertheless they all do differ in the figure of their points, for according as they have received more or less fermentation, they have also consequently their points more subtile, sharp, and light; and this is attested not only by the Taste, but the Sight also; for if you should Crystallize the same Body, by dissolving several parts of it in several vessels by the Spirit of Salt, Spirit of *Niter*, Spirit of *Vitriol*, Spirit of *Alom*, and by Vinegar, you'll observe so many kinds of Crystals different in figure, as there were different dissolutions. The Crystals made by Vinegar will be more

more sharp than those prepared by the Spirit of *Niter*, those made by the Spirit of *Niter* will be sharper than those by the Spirit of *Vitriol*, those made by the Spirit of *Vitriol* will be sharper than those by the Spirit of *Alom*; but of all these Crystals none will be found to have grosser parts than those prepared by the Spirit of *Salt*; for these Crystals do all retain the figure of their constituent parts. This now being supposed, it will be an easie matter to explicate our present Precipitation, for the Salt or its Spirit containing points more gross or less delicate than those of the Spirit of *Niter*, and falling on this dissolution do move, juttle, and easily break the points impregnated with the Spirit of *Niter*, and so make them let go their hold, whence it comes that *Mercury* precipitates down by its own gravity.

The same Principle, or way of arguing may serve to explicate, why *Lead* dissolved in *Vinegar* precipitates by means of the Spirit of *Vitriol*, or *Salt*.

You must observe not to make the Water too salt, for then the great quantity of Salt would keep up the *Mercury* from precipitating.

I add the volatile Spirit of Sal-Armoniack, which contains an Alkali, that the Precipitation may be done the sooner.

Red Precipitate.

Take eight ounces of *Mercury* revived out of *Cinnabar*, dissolve it in a sufficient quantity of Spirit of *Niter*, which is nine or ten ounces; pour the dissolution into a Viol or Matrafs with a short Neck, set it on Sand, and evaporate all the moisture over a gentle heat, until there remains a white Mass; then drive the fire by little and little to the third Degree, and keep it in this condition till all your matter is turned Red, then take it off the fire, let the Viol cool, and break it to get your Precipitate, which weighs nine ounces.

It is a good Escarotick, it eats proud flesh; it is used for the laying open of Chancres mixt with burnt Alom, *Aegyptiacum*, and the common Suppurative. Some do give it inwardly to four grains for to raise a Flux, but this is a dangerous undertaking, unless that Rectified Spirit of Wine be burnt two or three times upon it.

Remarks.

This Preparation is improperly called Precipitate, here being no Precipitation at all.

That which causes the Corrosion is the more fixt part of the Spirit of *Niter*, that closely adheres to the *Mercury*, and this is that which encreases

encreases its weight. If you would make it exceeding Escarotick, you must not let it grow quite red, because the more you Calcine it, you lose the more Spirits that rendred it Corrosive.

Turbith Mineral, or Yellow Precipitate.

put four ounces of Quick-silver revived out of *Cinnabar* into a Glass-Retort, and pour upon it sixteen ounces of Oyl of *Vitriol*; set your Retort on Sand, and when the *Mercury* is dissolved put fire underneath, and distill the humidity, make the fire strong enough toward the end for to drive out some of the last Spirits of all; afterwards break your Retort, and powder in a Glass Mortar a white Mass you find within it; keep half of it for an Operation I shall describe hereafter; pour warm Water upon the rest, and the matter will be presently changed into a yellow Powder, that you must dulcifie by a great many several Lotions, then dry it in the shade. It purges strongly, both by vomit, and stool, it is given in Venereal Maladies, the Dose is from two grains unto six in Pills.

Remarks.

Though that which is improperly called Oyl of *Vitriol*, be one of the strongest Acids and Causticks of this Mineral Salt, it is nevertheless much

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weaker

weaker than the Spirit of *Vitriol*, and so requires a greater quantity of it, and longer time to dissolve the *Mercury*, for there's much a-do to dispatch the Dissolution in ten Hours. That which is distilled is exceeding weak, because the *Mercury* retains the greatest part of Acid Spirits, and they are the things that purge so mightily, though many of them are carried off by the Lotions.

All these Preparations are nothing but so many Disguises of *Mercury* by Acid Spirits, which according to their different adhesions, do cause such different effects. The Colour doth in like manner proceed from their different ways of opening the body of *Mercury*, and from their various penetration.

All these Precipitates and Sublimates may be revived again into flowing *Mercury*, by mixing them with Quick-Lime, and distilling them, as I have said in the way of Reviving *Cinnabar* into Quick-silver, because the Alkali of Quick-Lime destroys those Acids that disguised the form of Quick-silver.

Oyl or Liquor of Mercury.

Take that part of the Mass you kept when you made Turbith Mineral; set it in a moist Cellar in a Glass-pan, and it will soon dissolve into a Liquor, keep it in an earthen, or strong glass Bottle; this is that which is commonly called the Oyl or Liquor of *Mercury*; it is used for the laying open
Venerial

Venerial Chancres, and eating up the Flesh, Pledgets being dipt in it, for it is a strong Caustick.

Remarks.

This Liquor is nothing but *Mercury* so penetrated and divided by the Acid Spirits of *Vitriol*, that it is able to dissolve like a Salt: now for that it contains these corrosive Spirits, it eats and corrodes where-ever it touches, like unto a Sublimate Corrosive.

This Liquor may be made with the spirit of *Niter*, and then it would be more violent in its Operation, but seeing it would then pierce too far, and cause some dangerous accidents, I would rather choose to prepare it with the Oyl of *Vitriol*.

If you drop a few drops of the Oyl of *Tartar* made *per Deliquium* into this Liquor, there will fall immediately a Mercurial precipitate, because the Alkali of *Tartar* will presently break the points that held up the *Mercury* before.

C H A P. IX.

Of Antimony.

Antimony is a Mineral consisting of a Sulphur like unto common Sulphur, and of a substance near approaching to Metallick, it is called *Stibium* in Latin. It is found in many places, in *Transylvania*, *Hungaria*, *France*, *Germany*. Sometimes you may meet with some of it at the Druggists, that is to say, just as it is taken out of the Mines, but that which is commonly brought among us hath been melted, and moulded into cakes of a Pyramidal forme.

Crude Antimony is used in Sudorifick Decoctions, when we would dissipate a tumour by Transpiration, but great care must be had that no Acid may enter into the Decoction, for then it would open its body, and render it *Emetick*. It is dangerous also to take it in substance, because it may be apt to meet with an Acid in the stomach that would pierce its body, and thereby cause a great vomiting to follow.

The reason that *Crude Antimony* causes sweat, is because of some Sulphurous Particles that separate from the *Antimony*, which not being strong enough to make one Vomit, do therefore Work by transpiration.

Common

Common Regule of Antimony.

Take a pound of *Antimony*, twelve ounces of crude Tartar, and six ounces of Salt-peter purified; powder them and mix them well together, then heat a large Crucible red-hot between the Coals, throw into it a spoonful of your mixture, and cover it with a Tile until the Detonation is over, continue to throw into the Crucible spoonfuls of this mixture one after another, untill all of it is spent; then light a great fire about it, and when the matter hath been some time in *Fusion*, pour it into a Mortar, or Iron-mould greased and heated, then strike the sides of the said Mould or Mortar with Tongs to make the *Regulus* precipitate to the bottom; when it is cold, separate it from the *Faces* that remain a-top it with a hammer, you'll have at least four ounces and a half of *Regulus*.

If you melt it over again, and forme it into Bullets of the bigness of a Pill, you have a *Perpetual Pill*, that is to say, such as being taken and voided fifty times will purge every time, and yet there's hardly any sensible diminution.

This *Regulus* is melted in a Crucible, and then cast into Moulds to make Cups and Gobelets. But it is somewhat hard to do it, by reason of a sharpness in the *Regulus* that hinders its parts from uniting enough to spread well. If you put White-wine into these Cups or Gobelets, it becomes Vomitive, like the *Vinum Emeticum*, I shall speak of anon.

Remarks.

Remarks.

This Preparation is made to open the Antimony, and purifie it from a great deal of gross Sulphur it is impregnated with, and for this effect it is Calcined with Tartar and Salt-peter, which do easily burn, and carry off with them good store of this Sulphur, the rest remains in the *Faces*, as I shall shew in the following Operation.

The mixture is cast into the Crucible by little and little, for fear lest if it should be put in all at a time, the Detonation growing too violent, and the Matter rarifying too much, it might fly out of the Crucible.

You must not grease the Iron Mortar with Oyl, by reason of a little humidity that it contains, which would make the matter rise and tumble out. It is greased to the end that the matter not sticking to the Mortar may separate from it the more easily.

Though good store of the *Antimonial* Sulphurs do exhale, the *Regulus* is notwithstanding still loaded with them, and it is they which chiefly give it its Vomitive virtue; for Vomiting doth proceed from too quick a motion that these Sulphurs make in the Stomach, by pricking the Fibres with some Salts they carry along with them.

If you mix this Emetick with an Infusion of *Senna*, or some such Purgative, it works as much by stool as by Vomit, because these Remedies do precipitate with them some part of the Sulphurs.

When

When one swallows the *Perpetual Pill*, it passes by its own weight, and purges downwards; it is washt and given again as before, and so on continually.

Almost all Chymists have written that it loses nothing at all of its weight, though taken several times. 'Tis true indeed the Diminution is but very small, yet nevertheless it would not be hard to remark it in some measure. It may be said also that in place of the Sulphurous parts which exhale to make a Vomiting, some extraneous bodies do succeed in their places, as it happens when *Antimony* is Calcined in the Sun.

When this Pill hath been taken and voided twenty or thirty times, it purges no more, as well because the more Soluble parts of Sulphur are gone away, as that what remains doth pass without any great effect. The same doth happen to Cups or Gobelets, which can't make the Wine so Emetick as before, after they have been filled twenty or thirty times.

Some do prescribe the *Perpetual Pill*, in the Disease called *Miserere*, but this practice is somewhat dangerous, because the Bullet stopping some time in the Intestines, which are knotted together in this Disease, may cause an Inflammation, and so exulcerate the part. It is given in the Colick, and then it does well.

Wine draws out the Emetick virtue of the *Regulus* much better than Water, because the Sulphurs do easily dissolve in the *Spirit of Wine*, whereas Water hath not strength enough to open them.

Golden

Golden Sulphur of Antimony.

Take the *Faces* of the *Regulus* of *Antimony*, powder them and boil them with common Water in an Earthen pot half an hour; make a *Lixivium* of it, and pour vinegar into the expression, there will precipitate a red powder; filtrate and separate your precipitate, dry it and keep it, it is called the Golden Sulphur of *Antimony*, and is an *Emetick*: the Dose is from two Grains unto six in broth or Pills.

Remarks.

Many Authors have written that the Golden Sulphur of *Antimony* was Diaphoretick, but doubtless they made it after another manner than we do.

The *Faces* of the *Regule* of *Antimony* are nothing but a mixture of the fixt parts of Salt-peter, and Tartar, that have retained among them some of the more impure Sulphur of Antimony. Now considering that Antimony becomes Vomitive for nothing but by reason of its Sulphur, you need not think it strange if the Sulphur that is separated from the *Faces* is Vomitive too. It causes near the same effect as the *Crocus Metallorum*, that I shall speak of hereafter.

Vinegar, or some other Acid falling into the dissolution of Sulphur makes a *Coagulum*, because

cause by raising of a Fermentation the Sulphureous and Terrestrious parts do separate and precipitate. This *Coagulum* may be otherwise explained, by saying that the Acids do joyn themselves with the grosser parts of this Liquor, and weighing them down do force them to precipitate; the same thing happens to Milk, when by growing stale it turns Acid, or some sharp Liquor is poured into it.

Regulus of Antimony with Mars.

Put Eight ounces of small Nails into a great Crucible, cover it, and set it on a grate in a Furnace; encompass it above and below with a good fire, and when the Nails are red hot, cast among them a pound of Antimony in powder; cover again the Crucible, and continue a great fire; when the Antimony shall be in perfect Fusion, cast into it by little and little three ounces of Salt-peter, and when there rise no more sparkles, pour out your matter into a Corner or Iron Mortar, that you shall have greas'd with a little Suet, and heated before-hand: then strike the sides of the Mortar with tongs, to make the *Regulus* fall to the bottom; when it is cold, separate it from the *Faces* with a Hammer: melt it in another Crucible, and cast into it two ounces of Antimony in powder; when it shall be in Fusion, add by little and little Three ounces of Salt-peter, which being burnt, and the matter casting no more sparkles, pour it into the Iron Corner greased

greased and heated as before, then strike it with Pincers, that the *Regulus* may fall down, and when it is cool, separate it from the *Faces* as I have said; repeat melting the *Regulus* twice more, and each time cast Salt-peter into it, but the last especially; you must observe to melt it well, before you cast the Salt-peter into it, that the Star may appear. There's no need of adding any more crude Antimony to the two last Fusions. This *Regulus* is used as the other, and hath the same effects.

Remarks.

The Iron in the first Fusion mixing with the Antimony turns almost all of it into *Faces*, because it joyns with the more impure Sulphur, so that the Reguline part being more weighty falls down to the bottom. Salt-peter is used for to penetrate the Antimony, and cause a more perfect Fusion, that this separation may be done the better. Moreover it carries off some Sulphurs by its volatile parts. The *Faces* then do consist of Iron, Sulphur, and fixt Salt-peter.

The Fusion is repeated three times over, because some portion of Iron doth always precipitate with the *Regulus*; and a little crude Antimony is added to the first of all, to the end the *Mars*, which easily joyns with Antimony by reason of a gross Sulphur it contains, may leave the *Regulus* and stick to it. The two last Fusions do make Gray or White *Faces*, and this is a mark, that the Salt-peter can receive no more.

Glass

Glass of Antimony.

Calcine in a small fire a pound of *Antimony* in powder, in an earthen pot unglazed, stir the matter continually with an Iron Spatule, until vapours arise no longer; but if notwithstanding your stirring, the powder should chance to run into lumps, as it often happens to do, put it into a Mortar and powder it; then Calcine it again, as I have said, and when it will fume no more, and be of a gray colour, put it into a good Crucible, cover it with a tyle, and set it in a Wind-Furnace, in which you shall make a very violent Coal-fire round about the Crucible, that the Matter may melt. About an hour afterwards uncover the Crucible, and putting the end of an Iron Rod into it, see whether the matter that sticks to it is become Diaphanous; and if it is, pour it upon a Marble well warmed, it will congeal, and you'll have the *Glass of Antimony*, which you must let cool, and so keep it for use. It is a strong Vomitive, and one of the most violent that is made of Antimony. The *Emetick Wine* is made of it by setting it to steep in White-Wine. It is given also in substance from two grains unto six.

An *Emetick Syrup* is prepared with the *Glass of Antimony* infused in the juice of *Quinces* or *Lemons*, and Sugar. If instead of these Acid juices, one should use Wine, the Syrup would be the more Vomitive.

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Remarks.

Remarks.

Antimony must be Calcined under the Chimny, and the vapours that fly out of it must be avoided as very injurious to the Breast.

This Calcination is performed to develt it of some gross Sulphurs that might hinder its Vitri-fication. Some do add to this gray powder *Borax*, others crude Antimony, and others Sulphur, that it may Vitrifie the more easily.

Glass of Antimony receiving more Calcination than the other Preparations, should consequently be less Vomitive, by reason of the dispersion and loss of much Sulphur, wherein its Vomitive virtue doth consist: Nevertheless experience shews us the contrary, for it works with more force, as I have said; and the reason of it is, because no Salt is used in the making of this Glass, whereas in the other Preparations Salt-peter is made use of, which by its fixt parts hinders the activity of some part of the Sulphurs; thus although there doth remain but a small quantity of Sulphur in the *Glass of Antimony*, yet as little as there is being in great motion, it causes a greater disposition to Vomit.

Liver of Antimony, or Crocus Metallorum.

Take a pound of *Antimony*, and so much *Salt-peter*, powder them, and mix them well together,

ther, put this mixture into an Iron Mortar, and cover it with a tyle ; leave an open place nevertheless through which you may convey a coal of fire, and take it out again, the matter will inflame, and cause a great Detonation, which being past and the Mortar grown cool, strike against the brims that the matter may fall downwards ; then separate the *Faces* with a Hammer, from the shining part, which is called *Liver of Antimony* from its colour.

To make the *Emetick Wine* you must infuse an ounce of this *Liver of Antimony* in powder in a quart of White-wine four and twenty hours, and so let it settle ; the Dose of this Wine is from half an ounce to two ounces.

The *Crocus Metallorum* is nothing but the *Liver of Antimony* washt several times with warm water, and so dried. It is used as the *Liver of Antimony* to make the Emetick Wine, and it is given in substance too to Vomit strongly : the Dose is from two to six grains.

Remarks.

This Preparation is a more impure *Glass of Antimony* than that I described, and consequently 'tis more opaque, it works not so violently as the *Glass*.

The *Liver of Antimony* hath a different force, according to the proportion of *Niter* that enters into it, when there's more *Niter* than *Antimony*, it is less Vomitive, not only because great store

of the Sulphurs of Antimony are lost in the strong Detonation that it raises, but also because there remains more fixt parts of the Salt-peter, which do joyn and unite with the Sulphurs that remain in the matter. Thus if instead of a pound of Salt-peter you should use twenty ounces, as many do, you'd have a *Liver of Antimony* less Vomitive than that I described. Now on the contrary when less Salt-peter than Antimony is used, the *Liver* that proceeds from this mixture is not so Vomitive as that I now described; the reason of it is that the Sulphurs of Antimony have not been sufficiently stirred by the Salt-peter in so little a quantity: for Antimony becomes not Vomitive, but only when it hath been sufficiently opened, either by fire, or some Salts. The most convenient proportion then that can be observed to render the *Liver of Antimony* as Vomitive as may be, is to take equal parts according to my description.

The strong Detonation that happens when fire is put to the matter, is not caused through the flagration of Salt-peter, as almost every body hath thought, through want of reflexion enough; I shall prove in its proper place that it can never take flame, and that its volatile parts do serve for a kind of Bellows or Vehicle to rarifie and exalt the Sulphurs of Antimony.

When the *Liver of Antimony* is washed with warm water, some part of the fixt *Niter* that remained in it is separated. Many have believed that the more violent part of the Emetick was carried off by this Lotion: but on the contrary,
this

this fixt part is more capable of mitigating than augmenting its violence for the reasons I have spoke already.

You must observe that if you should put four ounces of prepared Antimony into a quart of Wine, the Wine would not be more Vomitive than if you should put but an ounce ; because being loaded with as much substance as it is able to contain, the rest remains at bottom, and cannot be dissolved unless more Wine is added. Now an ounce of *Crocus Metallorum*, or *Liver of Antimony* is, according to experience, capable of impregnating not only one quart of Wine, but after having poured off the liquor by Inclination, if you put as much more Wine to the Matter that remains, and leave it in digestion two or three days together, you'll have an Infusion as Emetick as the first. You may if you please change the Wine anew nine several times, and it will always prove Emetick ; after which, if you Calcine your Matter a quarter of an hour in an Earthen Pot unglazed over a small fire, stirring the matter continually with an Iron Spatule, you may infuse it again as before, and it will render the Wine Emetick.

That Emetick Wine which is made with the *Crocus Metallorum* is most in use ; it is likewise prepared with the *Regulus* and *Glass*, as I have said speaking of them. It is given alone, or mixed with Purgatives, that convey it partly by stool. When you find an Inclination to Vomit, you must be provided of Broth a little fat, and take some spoonfuls to facilitate the Vomiting, and hinder the great efforts that sometimes break the vessels

and cause mortal Hemorrhagies to follow. You must also consider that those who have their breasts strait, and bodies thin, are much harder to vomit than others. But let us leave those particulars to the wisdom of Physicians.

Antimonium Diaphoreticum.

Powder and mix well together one part of *Antimony* with three parts of purified Salt peter; and having heated a Crucible red-hot between the Coals, cast into it a spoonful of your mixture, you'll hear a noise or Detonation, after that's over, cast in another spoonful, and continue to do so till all your Powder is in the Crucible. Leave a great Fire about it two Hours; then cast your matter which will be white into an earthen Pan almost filled with Fountain-water, and leave it a sleeping warm ten or twelve Hours, that the fixt Salt-peter may dissolve in it; separate the Liquor by Inclination, wash the white Powder that remains at bottom five or six times with warm Water, and dry it. This is called *Antimonium Diaphoreticum*, or Mineral Diaphoretick, or the Calx of *Antimony*.

This preparation is esteemed good to procure Sweat, to resist Poison, and consequently good in Malignant Feavers, the small Pox, the Plague, and other Contagious Diseases. The Dose is from six grains to thirty, in some appropriate Liquor.

All

All the Lotions may be evaporated, and a fixt Salt-peter will be found at the bottom of the Vessel, which works much like the *Sal Polychrestum*.

Remarks.

In this Preparation three pounds of Salt-peter are used for one pound of *Antimony*, that after sublimation of the Volatile parts there may remain store of Fixt *Niter*, which unites with the *Antimony*, and hinders it from being Vomitive.

It is observable, that three parts of *Niter* with one of *Antimony* do not cause so strong a Detonation, nor so great a Diminution, as when there are equal quantities. And the reason is, that there's too little Sulphur of *Antimony* for the quantity of *Niter*; for *Niter* cannot take flame without being mixed with Sulphurs, as I shall prove in the Chapter of *Salt-peter*.

You must put the mixture into the Crucible spoonful after spoonful, that the Calcination may be done the better. When it is ended, the Matter is washed, for to separate the Salt-peter that is useless. But let there be never so many Lotions, they can never carry off a certain enveloping or cover that is made by the Fixt Salt-peter; for each particle of *Antimony* is so closely chained, that it cannot any way be separated without recourse to some Reductive Salt; and this it is that makes this Preparation of *Antimony* to be

not at all Vomitive. Many do think it is Sudorifick, but I could never observe any such sensible effect. Nevertheless I would submit to think so, both because many Authors have written so, and because the heat of the body may possibly separate some of its Sulphurs, which not being strong enough to make one Vomit, may only drive by Transpiration Sensible or Insensible, according as the Pores are more or less open. Others do think *Antimonium Diaphoreticum* is meerly an Alkali, that is good for nothing but to destroy Acids, and on this Principle do give it for the same ends as Coral, Perles, Calcined Harts-horn, and such like things as do absorb sharp or Acid humours, which abounding too much in the body do cause several sorts of Diseases; but without doubt they that follow these Principles have not builded them on Experience; for pour any kind of Acid on *Antimonium Diaphoreticum*, it will never dissolve at all, and take away the Acid after a very long Infusion, it will be as strong as ever; which proves it to be no Alkali, and therefore not to produce the effects that are pretended.

The *Cornachine Powder* is made of equal parts of *Antimonium Diaphoreticum*, Diagryde, and Cream of Tartar. The Dose is from 20. to 45. Grains.

Another

Another Antimonium Diaphoreticum.

Take a good Earthen Pot unglazed, able to resist the Fire, with a hole in the middle of its height, and a stopple to it; set it in a Furnace of an equal proportion, and fit to it three Pots more of the same earth, all three open at the bottom, and fit a Glass-Head to the uppermost Pot, with a little Viol for a Receiver. Lute the conjunctions well, and by the means of some Bricks and Lute together, let the Fire transpire only through some little holes, and be but strong enough to warm the top of the lowermost Pot; then give your Fire by degrees, to heat this Pot by little and little red-hot.

In the mean time mix three parts of Salt-peter, with one of *Antimony* in Powder; cast a spoonful of it into the red-hot Pot through the hole, and stop it again quickly, you'll perceive a great Detonation, and after it is over, cast in another spoonful, and continue to do so until all your matter is spent. Then encrease the Fire to the utmost for half an Hours time, and so let it quench. Unlute the vessels as soon as they are cold, you'll find a little Spirit of *Niter* in the Recipient; white flowers in the three upper Pots, and a white Mass in the lowermost, that may be washed as the other *Antimonium Diaphoreticum*, and so dried. This Mineral Diaphoretick is as good as the former; you must wash the Flowers several times with warm Water, and then dry them.

them. They are not so Emetick as those I shall describe hereafter ; the Dose is from two to six grains.

Remarks.

In this Preparation the Volatile or Sulphurous parts of *Antimony* do stick to the sides of the Pots like Flower ; if you don't wash them, they will not be so Vomitive, because the Salt-peter that rises with them, hinders their activity.

The Acid spirit which is found in the Recipient may be used in the Colick ; the Dose is from four to eight drops in Broth, or some appropriate Liquor.

When *Antimony* is Calcined by the heat of the Sun, through a Burning-Glass ; instead of losing its weight, as one would think it should by reason of the evaporation of Sulphurous parts, it does increase in weight : which shews that some more ponderous Bodies have succeeded in the place of those that are gone.

Flowers of *Antimony*.

Fit the same Pots I spoke of in the last Operation, one upon another ; set them in the same Furnace, and observe the same circumstances for their situation, and for heating the lowermost. When its bottom is red-hot, cast into it a spoonful of *Antimony* in powder through the hole, and stir

stir the matter at the bottom of the Pot with an Iron Spatule crooked a little on purpose to do it the better; draw out your Spatule, and stop the hole, the *Flowers* will rise and stick in the upper Pots. Continue a great fire, that the Pot may still remain red-hot, and when you see nothing more sublime, cast in so much more *Antimony*, observing to do what I have said. Repeat the casting it in through the hole, till you have *Flowers* enough. Then let the fire go out, and when the Vessels are cold, unlute them, you'll find *Flowers* all about the three upper Pots, and the Head, gather them together with a Feather, and keep them in a Viol.

It is a powerful Emetick; it is given for Quartan Agues, and other Intermittent Feavers, and also for the Epilepsie; the Dose is from two grains to six in Lozenges, or Broth.

Remarks.

In this Preparation, as in the former, you must leave room enough, otherwise the *Flowers* of *Antimony* being driven fiercely by the fire, would be apt to break the Vessel for want of freedom in their motion. And this is the reason why many Pots are here placed one upon another. There's no need of any Recipient at all, because there's no Liquor to fall into it, so that a blind Head may serve.

At the bottom of the Pot that contained the Matter, there remains a Mass of the more terrestrial

restrious part of *Antimony*, that must be flung away as good for nothing.

If the *Flowers* of *Antimony* do happen to be of different colours, it is because the fire was not managed equally strong; these *Flowers* are more Vomitive than the former, because they have no Salt-peter in them.

Red Flowers of Antimony.

Powder and mix well together four pounds of common Glas with one pound of *Antimony*, put this mixture into an earthen, or glass Retort luted, whose half lies empty; set it in a Reverberatory Furnace, and fit to it a large Receiver, lute the conjunctions lightly, and give a little fire at first to warm the Retort, then augment it by degrees, and you'll see the *Red Flowers* come out into the Receiver: continue the fire until no more can come forth, which you'll know as you unlute the conjunctions; and taking off the Receiver gather your *Flowers*, and keep them for use. They are more Vomitive than the former, and are given to the same intents: the Dose is from two grains to four in a Lozenge, or some appropriate Liquor.

Remarks.

That which makes these *Flowers* more Vomitive than the former, is the more terrestrious or
fixt

fixt part of *Antimony's* being with-held by the Glass, so that what is exalted by the fire is more Sulphurous, and consequently more Emetick.

The red colour of these *Flowers* doth proceed from abundance of Sulphurs they are impregnated with, and one may say that Glass, which is an Alkali, acting on this Sulphur gives it this colour after the same manner as Quick-lime, or the Alkali Salt of Tartar makes common Sulphur turn red, when they are boiled together in Water.

The Day that you take these *Flowers* of *Antimony*, you must often drink Broth, both to facilitate the vomiting, and dull the great activity of this Remedy: for it is one of the strongest Vomits that is in Physick. But because it sometimes happens that this Powder sticking in the Membranes of the stomach, or some of its folds, doth cause a continual vomiting, notwithstanding the frequent use of Broths, you must then add the Cream of *Tartar*, and boil it in the Broth, and so take some spoonfuls every quarter of an Hour. This Cream of *Tartar* stops the vomiting, because it joyns with the Sulphurs of *Antimony*, and fixes them, so that they precipitate by stool.

Butter, or Icy Oyl of Antimony.

Powder, and mix four ounces of the *Regulus* of *Antimony*, with a pound of Sublimate Corrosive; put this mixture into a glass Retort, whose

whose half lies empty ; set your Retort on Sand, and after having fitted to it a Receiver, and luted the conjunctions, you must first make a small fire under it, there will distill a clear Oyl ; after that augment the fire a little, and there will come forth a white thick Liquor like Butter, which will stop the neck of the Retort, and so break it, if you don't take care to set live Coals near it, that it may melt and run into the Receiver. Continue the fire, until you see a red Vapour come forth. Then take away the Receiver, and put another in its place filled with Water. Encrease the fire by degrees, to make the Retort red-hot, and the *Mercury* will run into the Water, dry it, and keep it to use as other *Mercury*.

The *Butter of Antimony* is a Caustick, it eats proud flesh, and cleanses Ulcers ; the Powder of *Algarot* is made of it, as I shall shew in the sequel.

Remarks.

This *Butter of Antimony* is nothing but a mixture of the Acid Spirits of Sublimate Corrosive with the *Regulus of Antimony*, and those Spirits are they that render it Caustick.

The spirits of Salt and Vitriol in this Operation do forsake the *Mercury* for to adhere unto *Antimony* which is more porous ; insomuch that the *Mercury* being devided of that which kept it in a Crystalline forme, and stirred up by a strong fire, it rarifies into vapours, which pass through

through the neck of the Retort into the Receiver filled with Water, wherein it condenses into Quick-silver by means of the coolness.

I doubt not but some will find difficulty in conceiving how the Acids that adhered to the solid body of *Mercury* should strike off to joyn with *Antimony*; but one may say to that, that the Acids being so many edges fastned at one end in the body of *Mercury*, may by t'other end be separated and drawn off by the soft and ramous parts of *Antimony*, that are in a greater motion than *Mercury*.

Instead of *Regulus*, the Liver, or Glasse of *Antimony* might serve if you please.

Butter of Antimony, together with its Cinnabar.

Fill an earthen Retort, or Glasse one luted, half full with Sublimate Corrosive, and *Antimony* powdered and mixed well together. Set your Retort in Sand in a small Furnace, and fitting a Receiver to it, and luting the conjunctions, proceed in the Distillation the way I spoke of in the preceding Operation with *Regulus*, observing the same circumstances.

When red Vapours begin to appear, take away the Receiver, and without using any other, encrease the fire by little and little till you make the Retort red-hot; continue it so three or four Hours, then let the Retort cool, and break it,
you'l

you'll find a *Cinnabar* sublimed, and adhering to the neck, separate it and keep it: it is a good Remedy for the pox, and the Epilepsie, it purges by sweat, the Dose is from six to fifteen grains in Pills or *Bolus* with some proper Conserve.

This *Butter* of *Antimony* is Caustick like the other I now spoke of. It may be Rectified by distilling it anew in a glass Retort.

Remarks.

In the former Operation *Mercury* did not find Sulphurs enough to adhere to, whence it hapned that it came forth flowing; but in this Operation wherein Crude *Antimony* is used, which hath all its Sulphur, whilst the Corrosive Spirits sticking to the *Antimony* come forth in Butter, *Mercury* joyns with the Sulphur, and by the action of fire sublimes afterwards into *Cinnabar* in the neck of the Retort; for to make *Cinnabar*, Sulphur and *Mercury* must be sublimed together. Now if you have the curiosity to anatomise *Cinnabar*, you must powder it, and mix it with a double quantity of Salt of *Tartar*; then putting it into a Retort, distill over a great fire the *Mercury* into a Receiver filled with Water, the Sulphur will remain in the Retort with the Salt of *Tartar*, but may be separated from it by boiling it in Water.

Filtrate the Decoction, and then pour upon it Distilled Vinegar; a gray Powder will precipitate,

tate, which may be washed with Water and dried, thus you have the Sulphur of *Antimony*, which is much esteemed for Diseases of the Breast, six or eight grains of it are given for a Dose in some Liquor appropriate to the Disease.

The Emetick Powder of Algarot, or Mercurius vita.

Melt in warm Sand the first Butter of *Antimony* I described with *Regulus*, and pour it into an earthen Pan wherein are two or three Quarts of warm Water, a white Powder will precipitate, that must be washed with many Lotions, and so kept; it is improperly called *Mercurius vita*. It purges upwards and downwards, it is given in Quartan and Intermittent Agues, and all the Maladies wherein it is required to purge strongly; the Dose is from two grains to eight in Broth, or some other convenient Liquor.

If you joyn all the Lotions together, and evaporate about two thirds, or until the Liquor becomes extream Acid, you'll have a Philosophick Spirit of *Vitriol*, that may be used like common Spirit of *Vitriol* in Juleps, to give an agreeable acidity.

Remarks.

I have said before that the Butter or Icy Oyl of *Antimony* was nothing but a mixture of the spirits of Salt and *Vitriol* with the *Regulus* of
K *Antimony*.

Antimony. This last Operation confirms this thought, because when this Butter is cast into warm Water, these Spirits do render the Liquor very Acid, letting the *Regulus* of *Antimony* fall down to the bottom, so that the Powder of *Algarot* is an *Antimony* disguised, much like the white Flowers I spoke of before.

The Powder of *Algarot* may be made after the same manner as the Butter that may be drawn from Crude *Antimony*, or else with the Liver, or Glass, but that which is made with Crude *Antimony* is not so white as the rest.

Bezoar Mineral.

Melt in hot ashes two ounces of the Butter of *Antimony*, and pour it into a Viol or Matrafs, drop into it good spirit of *Niter* until the matter is perfectly dissolved, commonly so much spirit of *Niter* is requisite as Butter of *Antimony*; during the Dissolution there will rise up vapours, that you must have a care of, and therefore will do well to put it in the Chimney. Pour your dissolution into a little glass Body, or an earthen dish, and evaporate it in a gentle sand-fire until it is dry, there will remain a white Mass, that you must let cool, and then pour upon it two ounces of spirit of *Niter*; set the vessel again in Sand, and evaporate the Liquor as before; once more pour two ounces of spirit of *Niter* on the white Mass, and having evaporated the humidity, encrease the fire a little, and Cal-

cine

cine the matter for half an hours time, then take it off the fire, you have a white Powder, that you must keep in a Viol well stoppt. It is sudorifick, and serves for the same uses as *Antimonium Diaphoreticum*: the Dose is from six to twenty grains, in Broth, or some appropriate Liquor.

Remarks.

The Spirits of Vitriol and Salt were not strong enough, nor in quantity enough to make an entire dissolution of the *Antimony*, they only made a light adhesion to it, but when they are joyned with the spirit of *Niter*, they act with more force, so that they penetrate and divide every particle, and do render them imperceptible, and incapable of receiving a more exact dissolution. Now in this penetration, as in the dissolution of *Mercury*, there happens a great effervescency, for which reason I advise to pour the spirit of *Niter* by little and little, for fear the matter should rise above the vessel. This effervescency doth proceed from the resistance that the points of the Spirits do meet with, when they enter into the Pores of the *Antimony*: for as soon as the Dissolution is ended, there's no further Ebullition. Afterwards the humidity is evaporated away, and new spirit of *Niter* poured twice more on the first Mass, as I have said, after which the Butter of *Antimony* that was so great a Caustick, and Emetick, becomes one of the gentlest Remedies that we have, and near approaching the pre-

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paration

paration of *Antimony* that is called Diaphoretick.

This great change may well make us wonder at it, and it is hard to conceive how an Acid Corrosive Spirit, such as the spirit of *Niter*, should be able to sweeten a matter that became Caustick only for being impregnated with Acid spirits.

To give this difficulty some solution, one may say that the Butter of *Antimony* became Caustick, because the Acids not having strength enough to divide the *Antimony* sufficiently, did remain fixed in its body; but when through the assistance of spirit of *Niter*, the whole receives an entire separation, and is reduced into imperceptible particles, the Acid points cannot then take hold of these little bodies, nor adhere enough to render it Corrosive. It is true indeed that after the evaporation there remains some of the more fixt Spirits with the *Antimony*, but they are so blunt and dulled, that they now only serve to weigh down and incorporate with the Sulphurs of *Antimony*, so that they cannot be exalted any more to cause a vomiting.

This Powder is called *Bezoar Mineral*, because it causes Sweat, like the stone *Bezoar*. You must know that these Preparations are nothing but so many disguises of the *Regulus of Antimony*, made by Acid Spirits or by fire; so that by Fusion, or the means of some Reductive Salt, they may be recovered into *Regulus* again, by destroying those Salts that maintained it under this form.

Oyl of Antimony.

Take equal parts of *Antimony* and Sugar Candy, powder them and mix them, put this mixture in a Glass Retort large enough for the matter to fill but a third part; set your Retort in Sand, and fit a Receiver to it, give a gentle fire for the first hours to distill off a Phlegm, and when red drops begin to come forth, sling away that which is fallen into the Receiver; then refitting it, Lute the conjunctions, and make the fire a little stronger, but manage it prudently; for otherwise the matter will rarifie and flow into the Recipient in substance, so that you'll be forced to begin the Operation anew; continue the fire until nothing more comes forth.

This Liquor is improperly called *Oyl of Antimony*, being a Spirit of Sugar impregnated with some Sulphurs of *Antimony*. It is proper to cleanse Ulcers with, and for Tettars and Itchings that happen on the Skin. If it proves too sharp, you may temper and qualifie it with the Water of Honey.

C H A P. X.

Of *Arsenick*.

A *Arsenick* is a Mineral Body consisting of much Sulphur, and some Caustick Salts. There are three sorts of it, White that keeps the name of *Arsenick*, Yellow called *Auripigmentum*, or Yellow *Orpin*, and Red called *Realgal*, or *Sandaracha*, the White is the strongest of all.

None of these *Arsenicks* can be given inwardly, though several persons that have ventur'd to use the White, do pretend to have cured with it divers Diseases, and among others the Quartan-Ague. They venture to give as far as four grains, in a great deal of Water, and after that manner it will make one Vomit, like *Antimony*. But I can by no means allow of this *Febrifugum*, and would never advise any body to use so dangerous a Remedy. Nature doth furnish us with Medicines enough of Conscience to provoke Vomiting without recourse to *Arsenick*. It is used outwardly with sufficient success, because it eats up proud flesh.

People cover the Corns of their feet with *Arsenick* in powder, and it eats them to the Root without any pain, but they must be sure to cover the adjacent Flesh with a plaister of *Diapalma*,
after

after the same manner as when Causticks are applied.

Regulus of Arsenick.

Powder and mix together a pound of *Arsenick* with six ounces of gravelled Ashes, incorporate this Powder in a pound of soft Soap, and make a Paste of it, put it in a great Crucible, and cover it with an earthen cover, that hath a hole in the middle; set your Crucible in a Wind Furnace, and give a little fire at first, then augment it gradually, that the matter may melt clearly: throw it into a Mortar greas'd at the bottom, or into a Culot, strike it round about with pincers, and let the matter cool, then knock it out, you'll find in the bottom of the Mortar a *Regulus of Arsenick*, separate it from the *Faces*. It is not so Corrosive as *Arsenick* it self, and its effect is milder.

Remarks.

The Soap being full of an *Alkali* Salt, and the gravelled Ashes do correct or fix the great activity of the Sulphurs of *Arsenick*.

A Hole is made in the cover that the more volatile part may sublime with the Oyl and Humidity that are in the Soap, the *Alkali* Salts do remain in the *Faces* with some part of the more gross Sulphurs of *Arsenick*.

If by way of Curiosity you should boil these *Faces* in water, filtrate the Decoction, and pour Vinegar upon it, or some other Acid, to break the force of the *Alkali's*, a Sulphur of *Arsenick* will precipitate, that is stronger than *Arsenick* it self.

Arsenick being compounded of abundance of Sulphurs, is not so quick in its Operation as Sublimate Corrosive, because these Sulphurs do not eat so fast as Acid Salts.

If *Arsenick* should happen to be taken inwardly through any mistake, the person may still be saved half an hour afterwards, by swallowing good store of warm Oyl, to Vomit and Purge; after that he must be purged with *Cassia*, and Salt of *Tartar*, and he must often drink Salt of *Tartar* in Broths, that if any Sulphur should chance to remain, it might be fixed by this Salt; for when *Arsenick* is in the body, the heat of it raises and rarifies the Sulphurs on every side.

Sublimate of Arsenick.

Put what quantity you please of *Arsenick* grossly powdered into a Crucible, set it over a small fire under the Chimney to Calcine and Evaporate about the third part of the Matter. Avoid as much as may be this malignant vapour, pour into a Mortar that which remains, and when you have powdered it weigh it, and mix it with an equal quantity of *Salt Decrepitated*: put this mixture into a Matrafs, whose two thirds remain empty;

empty; set your Matrafs in Sand in a small Furnace, and making a small fire at first, encrease it by little and little to the third Degree, to Sublime the *Arsenick*: continue it in this condition until there rises no more, the Operation is ended in five or six hours, let the vessel cool, and break it, gather that which sticks to the top of the Matrafs, and keep it, fling away that which remains at bottom.

If one should repeat the Sublimation four or five times, adding Salt each time, a sweet Sublimate of *Arsenick* would be made, that is to say, much less corrosive than common *Arsenick*.

Some Authors tell us that this sweet *Arsenick* is a Counterpoison, but I should never think it convenient to trust to such an Antidote, seeing we don't want those that are safer.

The Sublimate of *Arsenick* eats proud flesh, and cleanses old Ulcers, being mixed with the common *Suppurative*, and *Aegyptiacum*.

The same Operation may be performed with *Orpin*.

Remarks.

The *Arsenick* is Calcined, to the end the more volatile part may evaporate; if you should continue the fire, and encrease it toward the end, every jot of the *Arsenick* would evaporate away. Some do sublime it without addition of any thing else, after it is Calcined, but it is better joyn some body that may stop it a little, such as Salt.

Seeing

Seeing the sublimate of *Arsenick* doth resemble sublimate Corrosive in colour, some Cheats do falsifie sublimate Corrosive by mixing with it that of *Arsenick*. I have shewn the way to discover this imposture in the Chapter of sublimate Corrosive.

Caustick Arsenick.

Powder and mix together a Pound of *Arsenick*, so much *Salt-peter*, and half a pound of *Sulphur*; put this mixture into an Iron Mortar, cover it with a Cover that hath a hole in't; thrust a red-hot Iron, or a lighted Coal, through the hole, the powder will take fire with a great noise called Detonation; this noise being over, and the matter cold, powder it grossly, and calcine it in a covered Crucible for two hours time over a great fire, then let it cool, and you'll have a Caustick matter that you must break into little pieces, and stop it close in a Bottel to use as common Causticks.

If you set it in a Cellar, or other moist place, it dissolves into a Liquor, like the salt of *Tartar*.

Remarks.

This great Detonation proceeds from the Flammation of common Sulphur, and that of *Arsenick*, which being violently driven about by the volatile

Volatile part of *Salt-peter* finds a little hole to fly out at. The more fixt part of *Arsenick* remains at bottom with the fixt *Salt-peter*. The matter is Calcined again, that being the more open, it may be the more Caustick; but this must be done in a covered Crucible; for otherwise the *Arsenick*, which is almost all of it Sulphur, would fly quite away by the great fire.

Corrosive Oyl of Arsenick.

Take equal parts of *Arsenick*, and Sublimate Corrosive, powder and mix them, put this mixture into a Glass-Retort, and set it in Sand; fit to it a Receiver, and luting the conjunctions, distill with a gentle fire a Butter-like Liquor, resembling the Butter of *Antimony*; and when no more will distill, take away the Receiver, and put another in its place filled with Water. Encrease the fire, and you'll see the *Mercury* fall into the Water drop by drop; continue the Distillation till there comes no more.

You may use this *Mercury* on all occasions, like the other, after you have washed and dried it.

The Butter of *Arsenick* is a very strong Caustick, it makes an *Eschar* more quickly than that of *Antimony*.

Remarks.

Remarks.

The same thing happens in this Operation, that I spoke of in the Butter of *Antimony*: that is, the Spirits of Sublimate Corrosive do leave the *Mercury* to joyn with the *Arsenick*, that they draw along with them in a gummous Liquor: the *Mercury* being afterwards disengaged, and finding no Sulphurs to fix it, comes forth in vapour, and condenses into Water.

C H A P. XI.

Of Quick-Lime.

Lime is a Stone, whose moisture the fire hath quite dried up, and brought in its place a great many igneous Bodies. It is these little bodies that cause the Ebullition, when Water hath opened the matter that kept them inclosed: and this Ebullition lasts until all the parts of the *Lime* are dilated, and the fiery particles set at liberty, that there's no need of further stirring to get out. These little igneous bodies do likewise render the *Lime* Corrosive, for the Stone is not at all so of its self.

Several

Several good Remedies are drawn from *Lime* for outward application, which I am going to describe : and besides that, I shall give the Preparation of divers visible and invisible Inks, for Curious persons.

Phagedenick Water.

Put a pound of *Quick-lime* in a large Earthen pan, and quench it with seven or eight Pints of Hot water, after the *Lime* hath infused five or six hours, and is fallen to the bottom, pour off the Water by Inclination, and filtrate it, this is that which is called *Lime-water*.

To each Pint of this Water are added fifteen or twenty Grains of *Sublimate Corrosive* in powder; and the Water presently turns Yellow; they are beaten together a good while in a Glass or Marble Mortar, and this water is used for cleansing old Ulcers : it eats proud flesh ; it is likewise used in the Gangreen, by adding the *Spirit of Wine* to it, and sometimes the *Spirit of Vitriol*.

Remarks.

Lime-water changes the colour of *Sublimate Corrosive*, because being an *Alkali*, it destroys some part of the Acids, which, according as they are diversly mixed with *Mercury*, do give it different colours.

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The Precipitate of the *Phagedenick-water* being washed and dried, is esteemed by some to be a good Purgative in Venereal Diseases: It is given in Pills, for fear of blacking the Teeth: the Dose is from one Grain to three, it purges upward and downward, and works much like *Turbith Mineral*.

Caustick Stones, or Cauteries.

Take one part of *Quick-lime*, and two parts of *Gravelled Ashes*, powder and mix them; Calcine the mixture in a Pot unglazed, for two or three hours; pour good store of Water upon your Matter, and leaving it in infusion five or six hours, boil it a little; afterwards pass that which is clear through a cloth, and evaporate it in a Copper Basin or an Earthen Pan, there will remain at bottom a Salt, that you must put over the fire in a Crucible, it will melt and boil till all the remaining humidity is evaporated. When you find it at the bottom like an Oyl, cast it into a Basin, and cut it into pieces while it is warm; put these *Cauteries* quickly into a strong Glass bottle, stop it with wax, and a bladder, for the Air would easily dissolve it into Liquor: you must also take care to keep it in a dry place.

These *Cauteries* are the strongest of all that are made; and they are but a quarter of an hour in their Operation.

Remarks.

Remarks.

These *Canteries* are compounded of the fixt Salt of Wine, and *Quick-lime*; for *Gravelled Ashes* are made by burning the Lees of Wine, so that the Salt which is drawn from it is altogether like the *Alkali* Salt of Tartar. Also instead of *Gravelled Ashes*, Calcined Tartar, or the fixt Salt of any Plant may be used. The *Quick-lime* mixing with this fixt Salt doth much encrease in force, as being full of igneous corpuscles very piercing. Moreover it keeps the Salt more open, and consequently more active.

If you would have the *Canteries* made very sharp, you must dip a warm Iron Spatule in the Crucible, while the matter is in Fusion, and so form the edges in a flat Basin.

The *Canteries* may be made several other ways, but this description is better than any others when you would have them work briskly.

In the places where Soap is made, the Chirurgeons do use to evaporate the water of Salt-wort, or Frog-grass, and make use of the Salt that remains at bottom for their *Cansticks*, but ours are much stronger.

Inks called Sympathetical.

Take an ounce of *Quick-lime*, and half an ounce of *Orpin*, powder and mix them, put your mixture

mixture into a Matrafs, and pour upon it five or six ounces of water, that the water may be three fingers breadth above the powder, stop your Matrafs well with Cork, wax, and a Bladder; set it in Digestion over a gentle fire in a Sand-heat ten or twelve hours, shaking the Matrafs from time to time, then let it settle.

Burn Cork, and quench it in *Aqua-vita*, then dissolve it in a sufficient quantity of water, wherein you shall have melted a little *Gumm Arabick*, to make an Ink as black as common Ink. You must separate the Cork that can't dissolve, and if the Ink is not black enough, add more Cork as before.

Get the Impregnation of *Saturn* made with Vinegar, distill'd as I have shewn before, or else dissolve so much *Salt of Saturn* as a quantity of water is able to receive: write on Paper with a new Pen dipt in this Liquor, take notice of the place where you Writ, and let it dry, nothing at all will appear.

Write upon the Invisible writing with the Ink made of burnt Cork; and let it dry, that which you had writ will appear as if it had been done with common Ink.

Dip a little Cotton in the first Liquor made of *Lime* and *Orpin*, but let it be first settled and clear; rub the place you writ upon with this Cotton, and that which appeared will presently disappear, and that which was not seen will appear.

Another

Another Experiment.

Take a Book four fingers breadth in bigness, or bigger if you will: write on the first leaf with your Impregnation of *Saturn*, or else put a paper that you have writ upon between the leaves; turn to t'other side of the Book, and having observed as near as may be the opposite place to your writing, rub the last leaf of the Book with Cotton dipt in the Liquor made of *Quick-lime* and *Orpin*, nay and leave the Cotton on the place, clap a folded paper presently upon it, and shutting the Book quickly, strike upon it with your hand four or five good strokes, then turn the Book and clap it into a Press for half a quarter of an hour; take it out and open it, you'll find the place appear black, where you had writ with the Invisible Ink. The same thing might be done through a Wall, if you could provide something to lay on both sides, that might hinder the evaporation of the Spirits.

Remarks.

These Operations are indeed of no use, but because they are somewhat surprizing, I hope the Curious will not take it ill, that I have made this small Digression.

Quick-lime and *Orpiment* being mixed and digested together in Water, do yield a smell much
L like

like that which happens when common *Sulphur* is boiled in a *Lixivium* of *Tartar*. This here is the stronger, because the *Sulphur* of *Arsenick* is loaden with certain Salts that make a stronger impression on the Smell. *Quick-lime* is an *Alkali* that operates here much like the *Salt* of *Tartar* in the other Operation; you must not leave the Matrafs open, or unstopt, because the force of this Water doth consist in something Volatile. The *Lime* retains the more fixt part of *Arsenick*, and the *Sulphurs* that come forth are so much the subtler, as they make a separation from their former chains, and this appears to be so; for these *Sulphurs* must of necessity pass through all the Book to make a writing of a clear and invisible liquor appear black and visible: and to facilitate this penetration the Book is strook, and then turned about, because the Spirits or Volatile *Sulphurs* do always tend upwards: you must likewise clap it into a Press, that these *Sulphurs* may not be dispersed in the air. I have found, that if these Circumstances are not observed, the business fails. Furthermore that which perswades me the *Sulphurs* do pass through the Book, and not take a circuit to slip in by the sides, as many do imagine, is that after the Book is taken out of the Press, all the inside is found to be perfumed with the smell of this Liquor.

There is one thing more to be observed, which is, that the Infusion of *Quick-lime* and *Orpin* be newly made, because otherwise it will not have force enough to penetrate. The three Liquors

quors should be made in different places too; for if they should come near one another, they would spoil all.

CHAP. XII.

Of Flints.

F*lints*, as all other Stones, do consist of different Salts, which meeting together in the bowels of the Earth do incorporate one with another, and from their mixture there results a *Coagulum*, which by little and little hardens by means of the Subterranean heat, or else do petrifie by the cold. Now you must observe, that these Salts are carried about by waters, which cause them to compound several sorts of Stones according as they are more or less filtred and purified. Thus Precious stones and Crytals do obtain their hardness and transparency, not only from a just proportion of these Salts, but also from their purity. There are found some waters in several places, which falling upon stones do soon petrifie, as particularly in a Grot at *Arsi* in *Burgundy*. The reason that may be given of this Petrification, is that these waters do contain some Salts that are capable of it; but because they are dissolved in a great deal of water,

L 2

they

they cannot come to Coagulate, until they meet with some terrestrious matter that strictly receives them by absorbing the too much moisture that did separate them before.

It remains now to give some *Idea* of the nature of Salts, by the rencounter that causes a *Coagulum*. There's a great deal of likelihood that Alkali Salts and Acids are the things that do it, because we can perceive nothing else by the help of Chymistry that is able to bring about so strict an union. Acids as points, fixing in the Pores of the Alkali do lose all their motion, and do likewise weigh down the other, and deprive it of a good part of its own motion; and from this the consequent repose of parts and Coagulation doth proceed.

Calcination of Flints.

Heat red-hot some *Flints* in the fire, and quench them in water; repeat heating and quenching them three or four times, or until they are friable, and can be finely powdered; you must choose *River Flints*, that are full of veins of several colours.

Crystal is Calcined after the same manner, but it is easier made friable than *Flints*. A Liquor and Tincture may be likewise drawn from it, the way I am going to shew for *Flints*.

Tincture

Tincture of Flints.

Mix well four ounces of Calcined *Flints* finely powdered, with four and twenty ounces of *gravell'd Ashes*: put this mixture into a large Crucible, cover it, and set it in a Wind-Furnace, light a fire about it by little and little, to warm it gently, and then encrease it to the last degree. Continue it in this condition for five hours time, that the matter may all along remain in Fusion. Thrust a Spatule into it, and see if your matter begins to grow diaphanous like Glass. If it doth so, pour it into a warm Iron Mortar, and it will presently congeal into a hard mass, which you must powder while it is warm, and put into a Matrafs very dry and warm: pour upon it the *Spirit of Wine Alcoholized*, four fingers above the matter; stop your Matrafs close with another, whose neck may be received into that which contains the matter. Lute the conjunctions well with a wet bladder, and set it in sand, give a fire under it that's strong enough to make the *Spirit of Wine* simmer for two daies together, it will turn of a red colour; unlute your Matraffes, and separating them asunder, pour off by Inclination the *Tincture* into a bottle: put new *Spirit of Wine* to that which remains, and digest it as before, separate the liquor that is turned red, and mingling it with the former, pour it all together into a Glass-Cucurbite, and cover it with a Head, fit to it a

Receiver, and lute the conjunctions, distil in a vaporous Bath two thirds of the *Spirit of Wine*, that may serve as before, then take your vessel off the fire, and keep that which remains in the bottom of the Cucurbite, in a Viol well stopd.

Remarks.

The *Calx* of *Flints* doth so strictly incorporate with the *Salt of Tartar* by Calcination, that they may be said to be converted into an Alkali Salt; and this I shall shew in the following Operation.

You must use the *Spirit of Wine* highly *Alcoholized*, otherwise you will not gain the *Tincture*; you must likewise observe to infuse the powdered matter while it is as warm as may be; two thirds of the *Spirit of Wine* are distilled off, that what remains may be the redder and stronger.

Almost all Chymists will needs made this red colour proceed from the *Sulphur* of *Flints* extracted by the *Spirit of Wine*, but there is very little likelihood that this pretended *Sulphur* should remain in the Crucible after so long and violent a Calcination. Again, though these Gentlemen would fain perswade us, that there is a fixt *Sulphur* in nature, it is in a manner impossible to conceive any such thing, and all the *Idea* we can have of a *Sulphur* is ever of a Volatile substance that is not able to resist the violence of fire. Therefore I shall admit for the only cause of this Redness, the exaltation of our
Alkali

Alkali matter in the *Spirit of Wine*, that disposes it to make the necessary impressions on our eyes to make it appear red.

Liquor of Flints.

Take the other part of your *Flints* Calcined with *gravelled Ashes*, and set in a Cellar in a Glass-pan, it will dissolve into as clear a *Liquor* as Water, filtrate and so keep it.

This *Liquor* is said to be Diuretick, it is given from six to five and twenty drops in some convenient Liquor.

If you mix an equal part of this *Liquor* with some Acid Corrosive Spirit, you'll presently make a kind of Stone.

Remarks.

The *Salt of Tartar*, or the *gravell'd Ashes*, have so attenuated the *Flint*, that it becomes as soluble as they; and we see the truth of this in the following Operation, for the moisture of the Cellar entring through the Pores of our Calcined Matter dissolves it perfectly, and if this dissolution should be evaporated, an Alkali Salt is found at bottom.

When this *Liquor* is mixed with an Acid spirit, an Ebullition presently happens, from the Acid Spirits piercing the Alkali, and afterwards a stronger Coagulation is made, than when an A-

acid Spirit is poured on the Oyl of *Tartar*; because this same Alkali contains more earth than the Salt of *Tartar*.

This *Liquor* may be able to dissolve some Sulphurous Obstructions that now and then happen, and then it provokes Urine; but if it meets with an acid humour, it causes a Coagulation, that may turn into stone: Wherefore I would not advise any body to use this Remedy, no more than the former *Tincture*, which works not but by its Salt that is mixed with the spirit of Wine.

From the Coagulation of these Liquors may be sensibly explicated, how stones come to be formed in several parts of our Bodies, seeing Acid Liquors and Alkalis do so often meet within us.

The *Tincture of Flints* is used to extract the *Sulphurs* of many *Minerals*, *Alchymists* have given it the name of *Alkabeſt*.

Oyl of Bricks.

Heat red hot among burning Coals pieces of *Brick*, and quench them in a Pan filled half full with *Oyl of Olives*, but cover it immediately, for the *Oyl* would else take fire. Leave them in Infusion ten or twelve Hours, or until the *Oyl* hath sufficiently penetrated the *Bricks*, after that separate them, and when you have grossly powdered the *Bricks* imbibed with the *Oyl*, put it in an earthen Retort, or glass one luted, large enough for a third part to remain empty; set it in a Reverberatory

ve: beratory Furnace, and fit to it a large capacious Receiver, lute well the conjunctions, and give a little fire at first to warm the Retort, then encrease it by degrees, until you see vapours come forth; then continue it in this condition till there comes no more: unlute the conjunctions, and take away the Receiver, there remains in the Retort all the *Brick*, which you must fling away as useless.

Mix the *Oyl* that remains in the Receiver with a sufficient quantity of other *Brick* dried and powdered, and make a Paste of it, form several little Pellets, and put them into a Glass Retort; set the Retort in Sand, and fitting to it a large Receiver, and luting them together, give a fire by degrees to rectifie all the *Oyl*, pour it into a Viol, and keep it for use; if there's any Phlegm in it, you must separate it.

'Tis a good Remedy applied outwardly to dissolve the Tumours of the Spleen, for the Palsie, Phthisick, and suffocations of the Matrix. It may be given inwardly from two to four drops, in Wine, or some appropriate Liquor. Some drops of it are instilled into the Ear to dissipate the flatulent humours that are there inclosed.

Remarks.

This Operation serves only to exalt the *Oyl* of *Olives*, that being more opened by the fire, it may rarifie and dissolve humours more easily;
for

for you must not imagine that the *Brick* doth communicate any great virtue, it is a dry body, and wanting all Active Principles.

You must make a very moderate fire in this Distillation, that the *Oyl* may come forth in vapours; for if it should come out drop by drop, it would not be so open, nor would it produce so good effects.

CHAP. XIII.

Of Coral.

C*oral* is a petrified Plant, that grows on Rocks, or rather it is a certain shoot from a Rock, that hath received the forme of a Plant. They are of several colours, as *White*, *Red*, and *Black*; now and then there are found some of two colours, as *Red*, and *Black*.

The *Red* is the most common, and most in use; it is chosen of a deep colour; the *White* is more rare than the *Red*. A certain white Stone very spongy, like unto *Coral*, is brought among us, which is mistaken for true *white Coral* by those that don't know it, but the true is not at all spongy; it is rather very compact, and as white as Ivory; *Black Coral* is the hardest to meet with.

Coral

Coral is prepared by beating it on a Marble into a most fine powder, that it may the easier be dissolved; and this Prepared *Coral* is given to stop *Dysenteries*, *Diarrheas*, *Flux* of the *Hemorrhoids*, and *Terms*, *Hemorrhagies*, and all other Distempers that are caused by an acrimony of the humours, this being an Alkali that destroys them; the Dose is from ten grains to a Drachm in Knot-grass Water, or some other appropriate Liquor.

Dissolution of Coral.

Take what quantity you please of *Coral* finely powdered on a Marble; put it into a large Matrafs, and pour upon it *Distilled Vinegar* enough to cover the matter four fingers high, there will happen a great Effervescency, which being over, set your Matter in Digestion in warm Sand for two Days, stirring the Matrafs from time to time. Leave the *Coral* to settle at the bottom, and separate by Inclination the clear Liquor into a Bottel. Pour again so much *Distilled Vinegar* on the remainder, as before, and leave it two days in Digestion; separate the clear Liquor, and continue to add more *Distilled Vinegar*, and draw off the Impregnation, until all the *Coral* is in a manner dissolved. Then mix your Dissolutions, and pour them into a Glass-Cucurbite, or else into an Earthen one, Evaporate in a Sand-Fire two thirds of the humidity, or until there appears upon it a very fine Pellicle: Filtrate this Impregnation,
and

and keep it to make the *Salt*, and *Magistery*, as I shall shew hereafter.

It may be given for the same purposes as the *Salt*, the Dose is from ten to twenty Drops in some appropriate Liquor.

Remarks.

Red Coral is generally used, because it is thought to have more virtue than the rest, by reason of its Tincture.

The *Effervescency* which happens, when *Vinegar* doth penetrate *Coral*, is reckoned among *Cold Effervescencies*, if there be any such; for my part, I can say I never perceived any Coldness in it. In truth it is sufficiently strange, that so great an Ebullition, or motion of the Parts, should not produce any sensible Heat, but you must consider, that *Coral*, as having large Pores, may be easily dissolved, and so the Acids need not jostle it very much, which would be requisite to produce any considerable Heat.

Some do use in this Operation the Acid Lotion of *Butter of Antimony*, or the pure *Spirit of Vitriol*, instead of *Vinegar*; but seeing these Spirits do leave too great acidity in the Preparations of *Coral*, I conceive it were better to use *Distilled Vinegar*.

Coral being an Alkali, the Acid points do stick in it, and holding up its parts, do render them imperceptible; and this is the reason that the *Vinegar* doth intirely lose all its acidity, because the

the acidity did only consist in the motion of its points, which do now sheath themselves in the Alkali.

If you would, by way of Curiosity, distill the humidity of this Dissolution, instead of Evaporating it, as I have said, you'd gain nothing but an Insipid Water, because the Acid is fixt with the *Coral*. This Water is Evaporated away, because it would serve for nothing, and would only weaken the Impregnation.

The Dissolution of Perles, Crabs-eyes, Burnt Harts-horn, and all other Alkali Matters, is performed after the same manner; Their *Salts* and *Magisteries* may be likewise made as those of *Coral*, that I am going to describe.

It is here remarkable, that the Dissolution of these sorts of Alkalies in *Distilled Vinegar*, smells like the spirit of Wine, and that some quantity of it may be drawn in a Limbeck, over a mighty gentle Fire; the reason of it is, that in the making of *Vinegar*, the Acids had in a manner fixed this Sulphurous Spirit, but when they do enter into the Pores of *Coral*, they are forced to quit it, and leave it to recover its Volatility.

Magistry of Coral.

Take what quantity you please of the *Impregnation of Coral*, either Red, or White, do the same with it in *Distilled Vinegar*, as I said before; Pour it into a Viol or Matrafs, and drop into it the *Liquor of the Salt of Tartar*, made
per

per Deliquium, a *Coagulum* will be made that will precipitate to the bottom in a very white Powder; separate by Inclination the clear Liquor, and washing your Powder five or six times with Water, dry it, 'tis that which is called the *Magistry of Coral*. Great virtues are attributed unto it, such as, to revive and fortifie the heart, resist Poison, stop the Bloudy Flux, and all other Hemorrhagies. The Dose is from ten to thirty Grains in some Liquor appropriate to the Disease.

Remarks.

The name of *Magistry* is given only to *Precipitates*; and they are so called to express something very exquisite.

The *Liquor of Tartar*, which is an Alkali Salt dissolved, engaging the Acid, makes it let go the Particles of *Coral* that it held suspended, and so they Precipitate by their own weight; this *Precipitate* is nothing else but a *Coral* finely powdered by means of Acids, which do easily divide into abundance of parts things that otherwise would seem indivisible. But you must observe here, that these Preparations, instead of rendring *Coral* more effectual as is pretended, do indeed render it almost good for nothing; which is a thing easie enough to prove. If we consider that *Coral* works in our bodies by nothing but its absorbing of Acids, or sharp and salt humors that continually produce diseases;
for

for example, it stops *Hæmorrhagies* by sweetning or smoothing the keen Salts that corroded the Membranes of the Veins, or else raised great Effervescencies in the blood to make it extravasate; it stops *Diarrheas*, by destroying the acrimony of the Choler, or other Humors; lastly, if it cures the falling down of the *Uvula*, and remedies many other accidents, 'tis done by nothing else, but breaking the force of Ferments that do cause them, after the same manner as it destroys the Acids of Vinegar, or some other Liquor; this being so, as there is great reason to believe it, it were far better to take *Coral* without any other Preparation than that which is made on the Marble, than dissolve it by an Acid, and precipitate it into a *Magistery*; for the Acids, or sharp humors that this *Magistery* is to encounter in our bodies, finding nothing that is able to blunt their edges, will continue their former activity, and so no effect at all will follow.

Salt of Coral.

Take what quantity you please of the *Dissolution* of *Coral* made by *Distilled Vinegar*, as I said before, pour it into a Glass Cucurbite, or Earthen pot, and evaporate in a sand-fire all the moisture, there will remain at bottom a *Salt of Coral*; keep it in a Viol well stoppt; it is given for the same reasons as the *Magistery*, the Dose of it is less, 'tis from five to fifteen grains.

Remarks.

Remarks.

In this Evaporation there come forth only the Watry parts, and the Acids adhering to the *Coral* do forme a kind of *Salt*.

If you should put this *Salt of Coral* into a Retort, and distill it in a Sand-fire, you would get a Liquor that's only styptick, without any considerable acidity, which shews that the Acids are destroyed, and do not come forth of the Alkali, as they entred in.

Tincture of Coral.

Melt *White Wax* over a gentle fire, in an Earthen or Glass Vessel; and throw into it *Red Coral* in branches of the deepest colour; the *Wax* must be a finger above the *Coral*, and remain over the fire in Fusion two Days, after which you'll find your *Coral* turn'd white, and the *Wax* of a *Red Tincture*, take away your *Coral*, and having heated and dried it, you'll have a *White Coral*; put other *Red Coral* into the same *Wax*, and leave it infusing as before, then take it out, your *Wax* will be *Redder* than it was; let it cool, and cut it into small pieces, infuse it in enough *Spirit of Wine* to cover it three fingers high, and leave it so till the *Spirit of Wine* is impregnated with the *Tincture*, that the white *Wax* had received, filtrate the Liquor to separate the *Wax*;
wash

wash this Wax, and it will serve as before; mix your *Tincture* with twice or thrice as much Water, that if any Wax remains dissolved, it may be separated; filtrate and evaporate the Liquor in a Glass-Cucurbite over a Sand-fire, to the consumption of three fourths, there will remain a Red Liquor, keep it in a Viol well stoppt: it fortifies the Heart, and drives ill humours by Transpiration, or by Urine, the Dose is from eight to twenty drops in some appropriate Liquor.

Remarks.

The *Tincture of Coral* consists in somewhat Bituminous, that can't be dissolved but by *Sulphurs*; the *Spirit of Wine* is not strong enough to separate it from the body of *Coral*; *Wax* doth contain Spirits that are more capable of making such a Separation. The *Coral* that remains may serve as *White Coral*.

Water is mixed in the last *Tincture*, to the end that the *Spirit of Wine* being weakned, may let go some portion of Wax that it had dissolved, and afterwards the *Spirit of Wine* is evaporated, and leaves the *Tincture of Coral* in Water.

Another Tincture of Coral.

Powder and mix together equal parts of *Red Coral*, and *Sal Armoniack*; put this mixture into an Earthen Cucurbite that is able to resist the
M fire,

fire, and fit to it a Head and Receiver. Lute well the conjunctions, and give a little fire under it, there will rise a small quantity of Volatile Spirit, and when you perceive there will distill no more, encrease the fire by degrees, and Flowers of divers colours will sublime, and stick to the Head; continue a moderate heat, until there rise no more, which you'll know by the Head's growing cold; then take away the fire, and when the Vessels are cold, unlute them; separate the Flowers from the Head, and put them into a Matrafs; pour upon them *Spirit of Wine* well *Alcoholised*, till it rises four fingers above them; fit another Matrafs to it, for to make a *Double Vessel*: Lute well the conjunctions, and set it in Digestion in a Sand-fire, or else in Dung, three or four Days, or until the *Spirit of Wine* is become Red, and the Flowers white; separate by Inclination this *Tincture*, and when you have filtered it, keep it in a Bottle well stoppt. It hath the same virtues as the former.

Remarks.

The Volatile Spirit which comes forth before the Flowers, is nothing but a little Volatile, Urinous, Armoniack Salt, that is separated from the fixt part, and dissolved in a little Phlegm that was contained in the Sal Armoniack; this Spirit may serve for the same uses as the other Volatile Spirit of Sal Armoniack, that I shall speak of in its proper place.

Coral,

Coral, being an Alkaly, gives way to this separation, after the same manner, as doth the Salt of Tartar, or Quick-lime; but because it is not so powerful an Alkaly as those, and that there is but a small quantity of it, there is not separated so much Volatile Salt.

These Flowers are nothing but a Sal Armonick rarified, and filled with the more Bituminous parts of *Coral*, which are most disposed to sublime: 'Tis in these parts also that the red colour of this Mixt doth consist; for that which remains at the bottom of the Cucurbite is a very white Mass.

It may be likewise said, that some quantity of Acid fixt, Sal-Armoniack remaining with the more terrestrious part of *Coral*, hath so far attenuated and subtilised it, as to make it appear of this white Colour; after the same manner as Red Coral, when reduced into a fine Powder, either by Acids, or Levigation, becomes exceeding white, as we see in the *Magistery of Coral*.

This explication is sufficiently proved, when any body takes the pains to view a little of this *Magistery* through a good Microscope, for if the Convex Glass can but magnifie the object sufficiently, it will appear Red, like Coral intire.

C H A P. XIV.

Of Common Salt.

THere are three sorts of *Common Salt*, the *Fossile Salt*, the *Fountain Salt*, and the *Sea Salt*; the first is called *Gemma*, by reason of its transparency and smoothness, like unto a Precious Stone; it is that which whole Mountains are found full of in *Poland*, and other Places; the second is drawn by Evaporation of the Waters of some Fountains, and the last from Sea-water by CrySTALLIZATION or Evaporation: These three Salts are of the same nature, and have almost the same effect; they are used, not only in Aliments, but sometimes in Remedies too, such as Clysters, when they should be made very Carminative.

It is here observable, that *Sal Gemma* is a little more penetrating than *Sea-Salt*, that is drawn by CrySTALLIZATION, and that the *Sea-Salt* which is drawn by CrySTALLIZATION is more penetrant than that which is made by Evaporation of the Waters that contained it.

The reason that may be given for the *Sal Gemma* is this, that having never been dissolved in Water, it never lost any of its points, whereas the others lose their more subtle edges in the Waters, and this chiefly when those Waters are strongly mov'd about, as are those of the Sea.

The

The *Sea-Salt* which is made in *Normandy* by evaporation of Sea-water over the fire, is not so strong as that which is made at *Rochell*, by CrySTALLIZATION, because in the evaporation many of the subtler parts of the Salt are lost, and a mark of that is; that if Sea-water is distilled over a fire never so small, it will not fail to carry away some Volatilized Salts, which will alter its virtue, as experience hath testified several times.

But it doth not happen thus to Sea-salt CrySTALLIZED, for it fixes of its own accord, when the Salt-waters have reposed for some time in fit places.

I have described my thoughts with length enough, touching the Origine of these three sorts of Salts, in the Remarks I made on the Principles, wherefore there's no need of repeating what I then said.

Salt is *Purified*, by dissolving it in water, then filtrating the dissolution through brown paper, afterwards evaporating all the moisture in an Earthen Pan to a white Salt.

Calcination of Common Salt.

Heat a pot, that's unglazed, red-hot between burning coals; throw into it about an ounce of *Sea-salt*, then cover it, and it will crackle, and so fall into powder: this noise is called *Decrepitation*: when it is over, put so much more Salt into the Pot, and continue to do so, till you have enough. The Pot must be sure to be red-

hot all the while: when the crackling is over, take the Pot out of the fire, and when it is cold, put the Salt into a bottle, and stop it well, to hinder the air from entring in to moisten it anew. Bags full of it are applied behind the neck warm, to consume the too great moisture of the Brain, by opening of the Pores. It is used likewise in several Chymical Operations.

Remarks.

That which makes the Salt crackle, when it is in the fire, is an inwardly contained moisture, which upon its being rarified doth force its way out with impetuosity; and finding the Pores too closely shut to suffer an easie escape, doth break through the parts and open a passage. Now every thing else that hath close compact pores, will make such a noise too in the Calcination, as do Glasse and Shells.

If you have occasion to use *Salt decrepitated*, it is convenient to have it newly Calcined, because the moistness of the Air contributes again what the fire had driven away. But if you would keep it any time, let it be in a Glasse bottle well stoppt.

Seeing this Salt is deprived of all humidity by its Calcination, it will absorb ferosities much better than common Salt. It is laid hot behind the neck, to the end that opening the Pores it may facilitate transpiration. A little *Salt of Tartar* may be mixed with it, for to render it the more active.

Spirit

Spirit of Salt.

Dry *Salt* over a little fire, or else in the Sun, then powder finely two pounds of it, mix it well with six pounds of Potters Earth, or *Bolus* powdered, make up a hard paste of this mixture with as much Rain-water as is needful, form out of it little pellets of the bigness of a Nut, and set them in the Sun a good while a drying; when they are perfectly dry, put them into a large earthen Retort, or glass one luted, whereof a third part remains empty; place this Retort in a Reverberatory Furnace, and fit to it a large capacious Receiver, without luting the conjunctions, give a very moderate heat at first to warm the Retort, and make an insipid water come forth drop by drop; when you perceive some white clouds succeed these drops, pour out that which is in the Receiver, and having refitted it, lute the conjunctions close; encrease the fire by degrees to the last degree of all, and continue it in this condition twelve or fifteen hours, all this while the Receiver will be hot, and full of white clouds, but when it grows cold, and the clouds do disappear, the Operation is at an end; unlute the conjunctions, and you'll find the *Spirit of Salt* in the Receiver, pour it into an earthen, or glass bottle, and stop it well with Wax: it is an Aperitive, and it is used in Juleps to an agreeable acidity for such as are subject to the Gravel. It is likewise used for cleansing the
M 4 Teeth,

Teeth, being temper'd with a little water, and to consume the rottenness of Bones.

To make the *Dulcified Spirit of Salt* of *Basilins Valentinus*, you must mix equal parts of the *Spirit of Salt* and *Wine*, and set them in digestion two or three days in a *Double Vessel*, in a gentle sand-heat. It is esteemed better than t'other to be taken inwardly, because it is less Corrosive, being corrected by the *Spirit of Wine*; the Dose is from four to twelve drops in some liquor appropriate to the Disease.

Remarks.

The Potters earth, or *Bolus* is mixed with the Salt, to divide it into Particles, that the fire may more easily be able to rarifie it; for the parts that Salt consists of are so strictly united, that the utmost force of the fire is not able to stir them about, untill they are separated by some *Intermedium*.

The Preparation that I give Salt, before it is put into the Retort, is longer than the ordinary way; but I have observed, that the Spirit comes forth with less difficulty, when the matter is prepared according to this form.

You must leave a vacuity in the Retort, and fit it to a large Receiver, for giving liberty to the Spirit to circulate before 'tis dissolved, otherwise it would break them both. Likewise the fire must be encreased by little and little, because the first Spirits break out with a mighty violence, when they are driven too hard. Some

Some ways of drawing the *Spirit of Salt* without addition have been much sought after, but that is not yet well discovered. It is true indeed, *Monsieur Seignette*, an Apothecary of *Roche*, among other excellent discoveries that he hath made on Salts, to the knowledge of which he hath particularly applied himself, brought me hither a Sea-salt in the year 1672, that we distilled without addition of any thing else, by a very moderate fire, and in two hours time we drew three ounces and a half of very good Spirit, out of six ounces of Salt, that we put into the Retort. After this we broke the Retort, and having powdered the Salt that remained in it to the weight of two ounces and a half, we exposed it to the air in a Pan for a fortnight, and we found it reimpregnated with Spirits; we Distilled it once more, and with the same ease as before, we drew half its weight in Spirit, of the same force as the former. The Matter remaining in the Retort being again exposed to the air recovered new Spirits. *Monsieur Seignette* did assure me, that he had thus drawn Spirit from the same Matter Nine several times; which is a thing worth our admiration, and shews us very well that the Air contains a Spirit which forms diverse things according to the different disposition of the subjects that it enters into. This Salt is particular to him that shewed it me, and he prepares it himself some way that he's unwilling to discover.

It is observable that the Acids which are drawn by so violent a fire do very much differ from those that are made Naturally, such as the Vinegars

gars of Beer, Wine, Cider, the Acid of Citron, &c. The *Spirit of Salt* among others hath some particular difference from the rest, because it will Precipitate that which *Aqua Fortis* hath dissolved. This Acid, according as may be judged by its effects, is compounded of stronger, and more weighty points than the rest, but they are not so sharp and piercing. And this is the reason that it jogs so effectually those of *Aqua fortis* loaded with some bodies they have dissolved, and that shaking them about it makes them let go their hold.

It is also remarkable, that the Effervescency which happens when the *Spirit of Salt* is cast into the dissolution of some bodies by *Aqua fortis*, is different from that which happens when some Alkali is cast into it, the former being much more gentle than the latter.

The *Spirit of Salt* dissolves Leaf gold, which *Aqua-fortis* is not able to do.

When this *Spirit* is *Dulcified*, it is mixed with *Spirit of Wine*, which being a *Sulphur* doth intangle the edges of the Acid, and in part hinders their motion; whence it comes to pass that this *Spirit* is more tempered by this addition, than if water had been used instead of *Spirit of Wine*.

The *Spirit of Salt* may be made with *Salt Detrepatated*, after the same manner.

C H A P. X V.

Of Niter or Salt-peter.

N*iter* is a Salt impregnated with abundance of Spirits out of the Air which do render it Volatile, it is taken from among the Stones and Earths of old ruined buildings. Some of it is likewise to be found in Cellars, and several other moist places, because the Air doth condense it in those places, and easily unites with the Stones.

Salt-peter is also sometimes made by the Urine of Animals, falling often upon Stones and Earths. Nay some have been pleased to think that all *Salt-peter* comes from that cause, whereas we see every day that some of it is taken out of places, where never came any Urine at all. This Salt is half Volatile, and half like unto *Gemma*, as I shall prove hereafter.

Salt-peter is not at all inflammable, as the greatest parts of Chymists do believe; but where it finds some *Sulphur* in the fire, it unites with it, and promotes its flagration by its Volatile part; so that it serves for a Vehicle to it.

Now because there is *Sulphur* in Coals, a considerable flame is kindled, as soon as it is cast upon them; on the contrary if it is cast into a Crucible heated red-hot in the fire, it will not burn

burn at all, because it will meet with no *Salphur* there.

Purification of Salt-peter.

Dissolve ten or twelve pounds of *Salt-peter* in a sufficient quantity of Water, let the dissolution settle, and filtrate it, then evaporate it in a glass or earthen vessel, to the diminution of half, or until there begins to appear a little skin upon it; then carry your vessel into a cool place, stirring it as little as may be, and leave it there till the morrow, you'll find Crystals that you must separate from the Liquor; evaporate this Liquor again to a skin, and set the vessel in a cool place, to get new Crystals; repeat the Evaporations, and Crystallizations, until you have drawn all your *Salt-peter*.

Note that in the last Crystallizations, you'll have a Salt altogether like unto Sea-salt, or *Sal Gemma*, keep it apart, it may serve to Season meat with.

The first Crystals are pure *Salt-peter*.

You may, if you please, dissolve and purifie *Salt-peter* several other times in water, observing every time what I said before, for to render it more white, and purifie it from its Sea-salt.

Salt-peter purified is a great Aperitive, it cools the body by fixing the humours that are in too much motion, and drives them away by Urine. It is given in Feavers, *Gonorrhœas*, and many other Diseases; the Dose is from ten grains to a Drachm

Drachm in Broth, or some appropriate Liquor.

Remarks.

The first *Purification* that is given to *Salt-peter* is this: the Stones and Earths that contain it are grossly powdered; they are boiled in a great deal of water, to dissolve the *Salt-peter*: the dissolution is filtred, and then poured upon Ashes, to make a *Lixivium*; after it hath been poured upon the Ashes several times, it is Evaporated and Crytallized.

The Earth from whence *Salt-peter* hath been drawn, being set in the open Air, and stirred about from time to time, doth reimpregnate with a kind of Salt.

The long Crytals that we see *Salt-peter* shoot into, do proceed from its Volatile part, for that which is Crytallized last, is fixt like Sea-salt, and looks just like it.

Salt-peter can never be purified so well, but it will still contain a Salt like unto *Sal Gemma*, or Sea-salt, but in less quantity than before.

When *Salt-peter* is boiled a long time in Water, and over a great fire, some part of the Spirits fly away, and there remains at last nothing but a Salt like unto Sea-salt, or *Sal Gemma*, which serves to prove that *Salt-peter* is only a *Sal Gemma* fuller of Spirits than the other, as I said speaking of the Principles.

When you would Crytallize a Salt, you must dissolve it in a convenient proportion of Water;
for

for if there should be too much, the Salt would be weakned too much, and not be able to coagulate ; and if on the contrary there should be too little, the Crytals would be confounded one with another. Therefore to make 'em fair, you must take your vessel off the fire, when you perceive a little skin upon the Liquor, which is a mark to shew that there remains a little less Liquor than is convenient to hold the Salt dissolved, and thus when it comes to be set in a cool place, it will not fail to fix.

Acid Salts, and among them the Volatile, do Crytallize in much less time than others.

Salt-peter cools the body, by reason that being an Acid it weighs down and quiets the humours, which by their too great motion did heat the body, and so precipitates them by Urine ; for the Volatile Salts and Sulphurs, that all bodies are full of, are easily fixed by Acids.

Crystal Mineral, called Sal Prunella.

Powder two pounds of *purified Salt peter*, and put it in a Crucible, which you must set in a Furnace among burning Coals. When the *Salt-peter* is melted, throw into it an ounce of the *Flower of Sulphur*, a spoonful at a time, the Matter will presently flame, and the more Volatile Spirits of *Salt-peter* be carried away : When the flame is over, the Matter will remain in a very clear Fusion. Take the Crucible out with a pair of Tongs, and turn it upside down into a Brass Basin,

Bason, very clean, and a little warmed beforehand, to dry up the moisture that might be upon it; shake about the Bason to spread the Matter while it is cooling, and this is called *Sal Prunella*. If you desire to have it very pure, you must dissolve it in a sufficient quantity of Water, filtrate the dissolution, and crystallize it, as I have said in the *Purification of Salt-peter*.

It is accounted better than *purified Salt-peter* for Physical uses, because the *Sulphur* is thought to have corrected it. It is given to cool, and cause Urine, in Burning Feavers, in Quinsies, Gonorrheas, and other Diseases, that proceed from Heat, and Obstruction: the Dose is from ten grains to a drachm in Broth, or some other Liquor appropriate to the Distemper.

Remarks.

This Preparation is called *Sal*, or *Lapis Prunella*, either because the Essential Salt which is drawn from *Sloes*, or *Plums*, hath, near upon the matter, the same virtue and figure as *Crystal Mineral*, or else because it is given in Hot Feavers, whose heat is compared to that of a burning Coal, called *Pruna*. The *Germans* do give it the forme of a *Sloe*, after having coloured it red with *Roses*.

The Ancients thought it necessary to throw the *Flowers of Sulphur* on melted *Salt-peter*, to the end it might be made more Aperitive; but thereby it is deprived of the more piercing Spirits which

which the *Sulphur* carries away along with it; thus instead of rendring it more open, and effectual, the better part of it is carried away.

It is easie to perceive that this abuse is one of those that hath insensibly gained upon Men, and diminishes very much of the benefits that might be received from Chymical Physick, for want of applying themselves to examine well the constituent parts of natural things, before proposing of correctives. I should rather advise them to use simple fine *Salt-peter*, or purified from its fixt Salt three or four several times, as I have described, and I am confident, after the Experience that I have often made of it, that it will better satisfie the intentions of those who use it, than when it shall have been prepared with *Sulphur*.

Sal Polychrestum.

Powder and mix exactly equal parts of *Salt-peter*, and common *Sulphur*, throw about an ounce of this mixture into a good Crucible, which you shall have heated red-hot before-hand, there will rise a great flame, which being over, throw into it as much more of the Matter, and continue to do so, until all your mixture is used. Let the fire continue still four or five Hours, so as to keep the Crucible all the while red-hot, then pour out the Matter into a Brass Basin well dried by the fire, and when it is cold, powder it and dissolve it in a sufficient quantity of Water;

ter; filtrate the dissolution, and evaporate it in an Earthen Pan or Glass Vessel, in a Sand-fire, till it is dry. You'll have a very pure *Sal Polychrestum*; you must fling away as insignificant that which remains in the Filter.

Sal Polychrestum purges serous humours by stool, and sometimes by Urine: the Dose is from half a drachm to six drachms in some proper Liquor.

Remarks.

This *Salt* is properly a *Salt-peter* devided of its volatile part by *Sulphur*, it is called *Polychrestum* from the Greek word Πολύχρηστος, that is to say, good for several uses, because it is used not only to purge by stool, but by Urine too, being taken to the weight of one or two drachms in a Quart of Water in the Morning like a Mineral Water. It is commonly used in Infusions of *Senna* from one scruple to four, as well to increase the strength of the Purgative, as to draw more strongly the *Tincture* of *Senna*. Some do dare to give up to six drachms in a Pint or Quart of Water, to purge strongly; but I would not advise any body to use this Purgative all alone, by reason of vellications that it gives in passing through the Stomach.

Monsieur Seignette an Apothecary of *Rochel*, whom I spoke of before, hath put in use a certain *Sal Polychrestum*, which seems at first to be like unto this, but when it comes to be examined,

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there's found a notable difference, as well in the Crystallizations, (and when it is thrown into the fire) as in the effects; for whereas six drachms of this taken, as I have said, do cause Gripes in pricking the Membranes of the Stomach, that of *Monsieur Seignette* in the same quantity doth purge very gently without any Gripes, as he proves in a little Treatise that he hath made touching the uses of this *Polychrestum*. And the truth of it I have found my self in several Persons. The composition of this Salt is known to none but himself, who having given it a sufficient reputation in the chiefest Towns of *France*, hath left some quantity of it with me to distribute, and make use of here at *Paris*.

Salt of Sulphur.

Put four ounces of *Sal Polychrestum* prepared as I have said, into a Glass Retort, and pour upon it a Pint of *Distilled Urine*, and two ounces of *Spirit of Sulphur*; set your Retort in Sand, and fitting a Receiver to it distill away all the Liquor over a gentle fire. Cohobate the Distilled Liquor twice over, and have a care at the end of the last time not to make the fire too hot for fear of driving forth the Acid: but as soon as ever the drops cease, and there remains only a white Mass in the Retort, you must take away the fire, and let the Vessels cool. After that throw away the distilled Liquor as useless, break the Retort, and powder the Mass of Salt that's found in it,
and

and keep it in a Viol well stoppt. It is a very agreeable Acid Salt, which is dissolved from half a drachm to two drachms in a quart of Water to drink of in Feavers. It is likewise given in broth from ten grains to two scruples at the coming of the Fit; it opens all Obstructions, and works by way of Urine, and sometimes also by Stool.

Remarks.

This *Salt* is improperly called *Salt of Sulphur*; for it is nothing but a *Sal Polychrestum* impregnated with an Acid Spirit.

The Liquor is cohobated to open this Salt the more, and make the Acid penetrate the better.

It is good in Tertian Agues, and Continued Feavers, and on all occasions where there's need of calming the too great motion of the humours, because the Acid serves to fix the Volatile Salts, or Sulphurs, which are most commonly the principal cause of these Diseases.

Spirit of Niter.

Powder and mix well together two pounds of fine *Salt-peter*, and six pounds of Potters-earth dried; put this mixture into a large Retort, either of Earth or Glass luted, set it in a close Reverberatory Furnace, fit to it a great capacious *Balon* or Receiver, and give a very little Fire under it for four or five Hours, to make all the

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Phlegm

Phlegm come forth, which will distill out drop by drop. When you perceive there will distill no more, throw the Phlegm away that is found in the Receiver, and having refitted it, lute the junctures, and encrease the fire by little and little to the second Degree, there will come forth Spirits, which will fill the Receiver with white Clouds; then keep the Fire two Hours in the same Degree, after that encrease it to the greatest violence you can give it, and so the vapours coming forth all red, continue strengthening your fire till there come no more, the Operation will be ended in fourteen Hours. When the Vessels are cold, unlute the junctures, and pour your *Spirit of Niter* into an earthen Bottle, which you must stop with Wax.

Spirit of Niter is used for the dissolution of Metals, it is the best *Aqua Fortis* that is; and the corrosive virtue of other Waters of this nature doth chiefly proceed from the *Niter* that enters into their composition.

Spirit of Niter is *dulcified*, by mixing equal quantities of *Spirit of Niter*, and *Rectified Spirit of Wine*, and setting them to Circulate in a double Vessel three Days in Sand. It is good for the Wind Colick, and for Hysterical Diseases: the Dose is from four to eight drops in Broth, or some other convenient Liquor.

Remarks,

Remarks.

Clay or *Bolus* is mixed with *Niter* for the same reason that I spoke of already in the Distillation of Salt.

I fling away the *Phlegm*, because it only serves to weaken the *Spirit*. The white vapours do proceed from the Volatile part of *Salt-peter*, and are a weaker sort of *Spirit*; but the Red ones do come from the fixt part, and are the strongest *Spirit*: for which reason the fire is made so very violent towards the latter end. This fixt *Spirit* is commonly called the *Salamanders Bloud*.

When you use here *Purified Salt-peter*, there remains nothing in the Retort but only Earth.

I have boiled several times in Water a good while, the Earth that remained after the Distillation of the *Spirit of Niter*, and after evaporation of the filtred Decoction, I could find no Salt at bottom.

I have likewise observed, that out of two Pounds of *purified Niter*, one draws a Pound and fourteen ounces of *Liquor*, in *Phlegm* and *Spirit*.

A third part of the Retort, wherein the Operation is performed, must remain empty, and the Receiver must be mighty large; for otherwise these Spirits coming hastily forth would break all to pieces to get room enough.

The *Spirit of Wine* doth very well serve to dulcifie the *Spirit of Niter*; for being a *Sulphur*,

it easily joyns with the acids points, and renders them incapable of corroding as they did before.

Aqua Fortis.

Powder and mix three pounds of *Salt-peter* purified, and dried, with a pound and a half of *Vitriol Calcined white* as I shall shew hereafter: put this mixture into an Earthen Retort, or glass one luted, whose third part is to remain empty; place your Retort in a close Reverberatory Furnace, and fitting to it a capacious Receiver, Lute well the junctures: then begin to give a little fire to warm gently the Retort, and encrease it by little and little; but when you perceive the Spirits to come forth into the Receiver in Red Clouds, continue it for fifteen or sixteen hours in the same degree, then drive it to the last extremity, untill there do appear White Clouds instead of Red. Then let the Vessels cool, and unlute them, you'll find in the Receiver an *Aqua Fortis*, that you must keep in an Earthen bottle well stopd. It serves for nothing else but the dissolution of Metals.

Remarks.

I use to Calcine the Vitriol to a Whiteness, that the *Aqua Fortis* may not be weakned with an insipid water.

The greatest Corrosion of *Aqua Fortis* proceeds

ceeds from *Niter*, for the *Vitriol* doth yield but very weak Spirits in comparison with the other. I do acknowledge indeed that the *Oil of Vitriol* is exceeding Corrosive, but eighteen or twenty hours are not able to drive that out, for it doth not use to come until after three daies continual Distillation. The *Vitriol* then serves here only for a Matter to separate the *Salt-peter*, that it may, by the means of fire, rarifie into *Spirits*.

It is remarkable that if the fire should be continued for five days together, and so many nights, the Receiver would be all that while full of Clouds because the *Vitriol* would yield Spirits so long.

Sometimes *Alom*, and *Arsenick* are added to the composition of *Aqua Fortis*, but the description which I have given you is the best of all.

There remains in the Retort a Red Mass, which may be used like *Cholcothar*, for an Astringent.

Fixation of Salt-peter into an Alkali Salt.

Melt two or three pounds of *Salt-peter* in a strong Crucible among burning coals, throw into it a spoonful of coals grossly powdered, and there will rise a flame and Detonation, which being over, throw so much more, and continue to do so untill the matter inflames no longer, but remains fixt in the bottom of the Crucible; then pour it into a warm Mortar, and when it is cold, powder it and dissolve it in a sufficient quantity of Water; filtrate the dissolution

through brown paper, and evaporate all the moisture in an Earthen Pan in a Sand-heat, there will remain a very white Salt, that you must keep in a Viol well stoppt.

This Salt hath a taste like that of the Salt of Tartar, and they differ but little in virtue; it opens Obstructions, and works by way of Urine, and sometimes by Stool; the Dose is from Sixteen to thirty grains in some convenient Liquor.

It may be used to assist in drawing out the *Tincture of Senna*, a Red Tincture may be also drawn from it with the Spirit of Wine, as from the Salt of Tartar.

If this Salt is set in a Cellar, it dissolves into a Liquor like the Oil of Tartar: it is used to extract the Tincture of Vegetables, and Minerals.

Remarks.

Salt-peter in this Operation serves by its Volatile parts to fire the Coals, and carrying them up violently causes the Detonation; for, as I have said before, *Salt-peter* never makes a flame, unless joyned with some Sulphureous Matter, and Coals, 'tis known, are full of such parts.

The *Detonation* continues until all the Volatile parts of *Salt-peter* are fled away; for then the Coals having no more motion remain as they use to do, without rising up.

This Salt is dissolved in Water, then the Dissolution filtred, for to separate the terrestrious part.

When

When the humidity is consumed, there remains an Alkali Salt, by reason that the Salt of Coals, which is an Alkali, is intimately mixed with the parts of *Salt-peter*.

C H A P. XVI.

Of *Sal Armoniack*.

Sal Armoniack is either *Natural*, or *Artificial*. The *Natural* is found in hot Countries, such as many parts of *Africa*, that are near the *Torrid Zone*. It is found upon the Earth that hath imbibed the Urine of Animals, that is to say, where the Sun hath sublimed the Volatile Salt of this Urine, and made of it a *Sal Armoniack*. The *Artificial* is compounded of the *Salt of Urine*, soot, and *sea-salt*; these three Salts do make a mixture which seems to be fixt because the *Sea-salt* which is an Acid doth a little check the Volatility of the others, nevertheless if the *Sal Armoniack* be Calcined in a Crucible, it flies all away into the Air, by reason the Volatile Salts predominating do carry along with them the fixt.

If you would purifie *Sal Armoniack*, you must dissolve it in a sufficient quantity of water, filtrate the dissolution, and evaporate it until
it

it is dry in a glass vessel. You'll have a White Salt, that may be given from six to four and twenty grains in some convenient Liquor. It is an excellent Sudorifick and Diuretick; it is good in Malignant Feavers, and Quartan Agues, and to move the Months in Women. It is also used in some *Collyries*, or waters for the eyes.

Flowers of Sal Armoniack.

Powder and mix together equal parts of *Sal Armoniack* in powder, and *Sea-salt Decrepitated*; put this mixture into an Earthen Cucurbite, and having placed it in sand, fit to it a blind Head. You must give a gentle fire at first, and encrease it by little and little, as long as you perceive the *Sal Armoniack* to rise up like Meal, and stick to the Head, and uppermost part of the Cucurbite: continue the fire, until nothing more rises up, then let the Vessels cool; lift up the Head gently, and gather your *Flowers* with a Feather; keep them in a Viol well stoppt; they have the same virtue as the *Sal Armoniack*, but are given in a little less Dose, as from four to fifteen grains.

Remarks.

This Operation is performed, to the end the *Sal Armoniack* may be Volatilized, by checking some part of its fixt Salt by *Salt Decrepitated*

pitated which hath been added to it; thus these *Flowers* are a little more penetrant than the *Sal Armoniack*, though they are both compounded of the same Salts.

Iron or Steel powdered may be used instead of Sea-salt, as *Schroder* describes it, and then the *Flowers* are of a Yellow colour, because the Salts do take the *Tincture of Mars*.

Aqua Regalis.

Powder four ounces of *Sal Armoniack*, and put them in a Matrafs, or other glass Vessel of a good bigness; pour upon it sixteen ounces of *Spirit of Niter*, place the Vessel in sand a little warm until the *Sal Armoniack* is all dissolved, then pour the dissolution into a bottle, and stop it with Wax, this is *Aqua Regalis*.

Remarks.

This water is called *Regalis*, or Royal, because it dissolves *Gold*, which is the *King* of Metalls. It is likewise called *Aqua Stygia*, or *Chrysulca*.

The Vessel in which it is made must be of a sufficient bigness, because in a dissolution the Spirits do rarifie with so great violence, that they would be apt to break it, if they had not room to circulate in; when a great deal of this water is preparing at a time, you must take care to remove the Vessel from the fire, so soon as the dissolution begins.

Aqua

Aqua Regalis may be likewise made, with equal quantities of *Salt-peter*, and *Sal Gemma*, by mixing these Salts with thrice as much *Bolus* powdered, and the Distillation of it is made after the same manner as I spoke of, to draw the *Spirit of Niter*.

It is somewhat difficult to conceive how *Aqua Regalis* is able to dissolve Gold, which is a most solid Metal, and can't dissolve Silver, which is a much less solid body. Some *Chymists* endeavouring to resolve this difficulty, have said that Gold being a Metal fuller of *Sulphur* than Silver, did therefore require a Sulphurous dissolvent, such as *Aqua Regalis*, compounded of the Volatile Sulphurous Salts of *Sal Armoniack*: but this explication is destroyed of its self, for if Gold did contain more Sulphurs than Silver, it would consequently be less weighty, for *Sulphur* is one of the lightest Principles of Chymistry.

Moreover if we examine what happens in the composition of the Dissolvent of Gold, it will be no difficult matter to contradict this opinion: for we see that as soon as ever the *Spirit of Niter* begins to penetrate the *Sal Armoniack*, the Acid Salt joyns with it, and quits the Volatile Salts, which finding themselves disengaged from the bodies that held them in a manner fixed, do rise up with violence; but seeing these Salts, which are Alkalies, do meet in their passage with some Acids of the *Spirit of Niter*, the great Effervescency happens which is always wont at the meeting of Alkali Salts and Acids. This Effervescency being over, our *Aqua Regalis* remains in the

the Vessel : it is properly nothing else but an *Acid Sea-salt* dissolved in the *Spirit of Niter*, the Volatile Salts being either exalted, or destroyed by Acids ; and that which confirms this opinion is, that *Aqua Regalis* is as well made with *Sea-salt*, in which there are no Volatiles at all, as with *Sal Armoniack*, according as I have said.

It is not then by Discourses of this nature, that this *Phænomenon* can be clearly explicated. I am apt to believe, with more likelihood, that if *Aqua Regalis* be not able to dissolve Silver, the reason of it is because the points of the *Spirit of Niter* being magnified by the addition of Salt do slide over the Pores of Silver, not being capable of entering into them by reason of the disproportion of their figures, whereas they easily enter into Gold, whose Pores are larger, to make their divisions. On the contrary if the *Spirit of Niter* dissolves Silver, it is because its points are very subtle and fitly proportioned to enter into the small Pores of this Metal, and by their motion to divide its parts. These same points may likewise enter into the large Pores of Gold, but they are too small and pliable to act upon this body. There's need of stronger and keener Knives, which by filling its Pores more advantageously may have force enough to divide it.

I do easily foresee, it will be objected, that Gold being heavier than Silver, should have lesser Pores and not greater, because the weight of a body doth only consist in the proximity of parts ; but it is easie to solve this difficulty, by
con-

considering each Metal with a good Microscope, for the Pores of Gold are seen to be much larger than those of Silver, though indeed there are much fewer, and that will explicate very well why Gold is heavier than Silver, though its Pores are greater; for seeing they are at a good distance the one from the other, there's a very compact matter as it were intercepted, which causes all the weight; but the Pores of Silver being very near one another, and of a much greater number, do intercept less solid matter, and consequently it must be lighter. I'll use a familiar example, to make my self more plainly understood.

If you take two Vessels of the same size and bigness, and fill one with small Hail-shot, and t'other with large Bullets, that which holds the Bullets will be much heavier than that which is full of shot; and yet notwithstanding the vacuities between the Bullets are much larger, than those between the shot.

According to this *Hypothesis*, reason may be likewise given, why Gold is cut more easily than Silver; for the greater the pores of a Body are, the easier entrance will a pair of Sheers meet with.

Gold spreads under the Hammer more than Silver, because having larger Pores the Hammer makes a greater impression into it, and dilates the parts the easier.

Volatile

Volatile Spirit of Sal Armoniack.

Take a Pound of *Sal Armoniack*, and three Pounds of *Quick-lime*; powder them apart, and when you have mixed them in a Mortar, pour upon them six ounces of Water: stir the Matter about again, and put it quickly into a Retort, whose half must remain empty. Set your Retort in a Reverberatory Furnace, and fitting to it a great Receiver, and luting the junctures exactly, begin the Distillation with a little Fire, for two or three Hours; afterwards increasing it by little and little, continue it until nothing more comes forth; take off your Receiver, and pour out the Spirit immediately into a Viol, turning away your Head as much as may be to avoid a very subtil vapour that continually rises from it. Stop the Bottle close with Wax, to keep the Spirit in.

'Tis an excellent Remedy for all Diseases that proceed from Obstructions, and corruption of humours, such as Malignant Feavers, the Epilepsie, Palsie, Plague, Small-Pox, &c. It drives by perspiration, or by Urine: the Dose is from six drops to twenty, in a Glass of *Balm*, or *Carduus Water*.

Remarks.

Quick-lime, which is an Alkali, destroys the power of the Acid Sea-Salt, by which it in a manner

ner chained up the Volatile Salts in the *Sal Armoniack*, whence it comes to pass, that as soon as *Lime* and *Sal Armoniack* are mixed together, there exhales an unsufferable smell of Urine; for the Volatile Salts flowing forth abundantly do so fill the Nose and Mouth of the Artist, that he would never be able to put the mixture into the Retort, if he did not take good care to turn away his Head, while his Hands are at work.

Water is added to it to liquifie these Volatile Salts, for if there were nothing to moisten 'em, they would suddenly sublime to the neck of the Retort, and stopping it all together would break it to pieces.

This Spirit is nothing but a dissolution of Volatile Salts in Water; if you would sublime and separate it from the Water, you must put the Liquor into a Matrafs with its Head, and proceed as I shall shew when I describe the Volatile Salt of Vipers; but this Salt being dry, flies away more easily than when it lies dissolved in Water, so that it were better keep it as it is.

You must also have a care, when you remove the Receiver, not to hold your Nose over it; for this Volatile Salt suffering a greater separation than before, enters suddenly into the Nose, and hinders Respiration; insomuch that several Persons have been seen to fall into a swoon by that means alone. Now to avoid this accident, you had best have ready a wet Cloth, to stop the Receiver with, so soon as it is unluted.

This Spirit is an excellent *Menstruum* to make Precipitations with, it destroys Acids mighty well,
and

and so do all other volatile Alkalis; it is used to Precipitate Gold, after it is dissolved.

It is good in those Diseases I named, because it opens the pores, and drives away the humours by perspiration or by Urine, according to the disposition of Bodies: Moreover, as it is an Alkali, it destroys the Acids which caused these Diseases.

Again, it sometimes causes sleep, because it dulls the keenness of Acid Salts, which entering into the little conduits of the Brains, do cause perpetual watchings.

'Tis better give volatile Spirits in Sudorifick Waters, than Broth, because the Broth being taken warm, the heat would evaporate the better part of the volatile Spirits, before a Man can reach the Porringer up to his Mouth.

Another Preparation of the Volatile Spirit of Sal Armoniack, together with its Flowers, and Fixt Salt against Feavers.

Powder and mix together eight ounces of *Sal Armoniack*, and so much *Salt of Tartar*; put this mixture quickly into a Glass Cucurbite, and sprinkle it with three ounces of Rain-water, set a Head upon it, and after fitting the Receiver, and luting the junctures close with a wet Bladder, place your vessel in Sand, with a gentle fire at first to warm the Retort by little and little, and Distill the Spirit drop by drop; but when you

O

perceive

perceive there will distill no more, take away the Receiver, and stop it close : then encrease the fire to the third Degree, and continue it about two Hours, there will sublime the *white Flowers of Sal Armoniack*, which will stick about the bottom of the Head like Meal.

The Spirit hath the same strength, and virtues as the former.

Gather up the *Flowers* with a Feather, and use them as you would those I described before the Preparation.

There remains at the bottom of the Cucurbite a white fixt Mass. You must dissolve it in enough Water, then filter the dissolution, and evaporate until it is dry, you'll have a very white Salt, that may be reckoned a good Remedy for Intermittent Feavers : the Dose is from eight grains to thirty in the small Centaury Water, or some other convenient Liquor.

Remarks.

The Salt of *Tartar* serves in this Operation, as the *Lime* did in the other ; but being it is a more powerful Alkali than *Lime*, you must not use so great a quantity of it. The fixt Salt of *Niter* might be substituted in its place, or any other Alkali if you will.

When the Fire begins to warm the Matter, there do rise up into the Head store of volatile Salts, in a fine delicate Crystalline form, but the

the moist vapours coming upon 'em do dissolve 'em into Liquor.

The *Flowers* do proceed from some quantity of *Sal Armoniack*, that the *Salt of Tartar* had not power to penetrate.

The *Febrifugous Salt* is nothing else but a mixture of the *Salt of Tartar*, and the Fixt Acid part of *Sal Armoniack*, it works by Urine, and very seldom by sweat, by reason that being a fixt body, it Precipitates downward more easily than rarifies; and by this means it comes to open Obstructions, which are most commonly the cause of Agues.

Acid Spirit of Sal Armoniack.

Take what quantity you please of the *fixt Febrifugous Salt*, that I spoke of just now; powder it, and mix it well with thrice as much Potters-earth powdered: put this mixture into a Retort whose third part remains empty, place it in a close Reverberatory Furnace, and fit to it a large capacious Receiver. Lute the junctures close, and proceed in the Method I spoke of, to make the *Spirit of Salt*, you'll find in the Receiver an Acid Spirit, which is a very good Diuretick. It is esteemed to be specifick for Malignant Diseases: the Dose is to an agreeable acidity in Ju-
leps, and Broths.

Remarks.

This Acid Spirit proceeds from the fixt *Sal Armoniack*, for the Alkali contributes not one drop.

Some presume to affirm, that it dissolves Gold, but I could never find it do so, though I have put it into the finest Leaf Gold; for I have taken out the Gold as intire as before, after it had remained in it three or four Days.

C H A P. XVII.

Of Vitriol.

V*itriol* is a Mineral compounded of an *Acid Salt*, and *Sulphurous Earth*; there are four sorts of it, the *Blew*, *White*, *Green*, and *Red*.

The *Blew* is found near the Mines of Copper, in *Hungary*, and the *Isle of Cyprus*, from whence it is brought to us in fair Crystals, which keep the name of the Country, and are called *Vitriol of Hungary*, or *Cyprus*; it partakes very much of the nature of *Copper*, which renders it a little *Caustick*; it is never used but in outward applications,

cations, such as *Collyriums*, or Waters for the Eyes, and to consume proud flesh.

White Vitriol is found near Fountains, it is the most of all depurated from a Metallick mixture: it may be taken inwardly to give a vomit; it is likewise used in *Collyriums*.

There are three sorts of *Green Vitriol*, the *German*, *English*, and the *Roman*. That of *Germany* draws near unto the *Blew*, and contains a little *Copper*, it is better than the rest for the composition of *Aqua-Fortis*. That of *England* partakes of *Iron*, and is proper to make the *Spirit of Vitriol*. The *Roman* is much like the *English Vitriol*, excepting that it is not so easie to dissolve.

Red Vitriol is brought among us a few Years ago out of *Germany*, it is called *Natural Chalcotar*, and it is esteemed to be a *Green Vitriol Calcin'd* by some subterranean heat. It is the most unusual of them all, it stops Bloud, being applied to Hemorrhagies.

Gilla Vitrioli, or Vomitive Vitriol.

Dissolve what quantity you please of *White Vitriol*, in as much *Pblegm of Vitriol*, as is needful to dissolve it; filtrate the Dissolution, and evaporate two thirds of the moisture in a *Glass-Cucurbite*. Put the rest in a cool place for three Days time, there will shoot out *Crystals*, which you must separate; then evaporate a third part of the *Liquor* that remains, and set the Vessel a-

gain in a Cellar, there will shoot new Crystals; continue thus evaporating and crystallizing, until you have gotten all you can; dry these Crystals in the Sun, and keep them for use; the Dose is from twelve grains to a drachm, in Broth, or some other Liquor.

Remarks.

This is only a *Purification of Vitriol*, that serves to separate a little earth from it.

All the Liquor may be evaporated without any Crystallization, the *Gilla Vitrioli* will remain at bottom in a white Powder.

White Vitriol is employed in this Operation rather than *Green*, because it is milder.

The other *Vitriols* may be purified after the same manner.

After taking this Vomit, a Man sometimes voids by stool a black matter like Ink, because it frequently happens that some part of the *Vitriol* descending into the Guts, meets an Alkali that it joyns with, and so causes a blackness, as it uses to do when mixed with Galls.

Calcination of Vitriol.

Put what quantity you please of *Green Vitriol* into an Earthen Pot unglazed; set the Pot over the Fire, and the *Vitriol* will dissolve into Water; boil it to the consumption of the moisture, or else
until

until the matter turn into a greyish Mass drawing towards white; this is called *Vitriol Calcined* to whiteness. If you should Calcine this grey *Vitriol* a good while over a strong Fire, it would turn as red as blood. It is called *Cholcothar*, and it is good to stop blood, being applied to a Wound.

Remarks.

You must not Calcine the *Vitriol* in a glazed Pot for fear of dissolving the Vernish, which would change the nature of *Vitriol*.

It may be Calcined, or rather dried in the Sun, till it becomes white, and this Calcination deserves to be prefer'd before the other, but only it is longer a doing.

The *Vitriol* may be likewise spread about a Furnace warm'd a little, and so dried until it turns white.

Spirit of Vitriol.

Fill two thirds of a large Earthen Retort, or Glass one luted, with *Vitriol Calcined* unto whiteness; Place it in a close Reverberatory Furnace, and fitting to it a great Balon or Receiver, give a very small fire to warm the Retort, and make the Water come forth that might still remain in the *Vitriol*; and when there will distill no more, pour the Water out of the Receiver into a Bottle,

this is called *Phlegm of Vitriol*; it is used in Inflammations of the Eyes to wash them with: Re-fit the Receiver to the neck of the Retort, and lute the junctures exactly, encrease the Fire by degrees, and when you perceive Clouds to come forth into the Receiver, continue it in the same condition, until the Receiver grows cold; then strengthen the Fire with Wood to an extream violence, until the flame rises through the Tunnel of the Reverberatory as big as ones arm. The Balon will fill again with white Clouds; continue the Fire after this manner for three Days time, and so many Nights, then cease it: unlute the junctures when the vessels are cold, and pour the Spirit into a Glass-Cucurbite, set it in Sand, and fit to it quickly a Head with its Receiver; lute the junctures close with a wet Bladder, and distill over a very gentle Fire, about four ounces of the moisture, this is the *Sulphurous Spirit of Vitriol*, keep it in a viol well stopd.

It is good for the Asthma, Palsie, and Diseases of the Lungs, the Dose is from four drops to ten in some convenient Liquor.

Change the Receiver, and augmenting the fire, distill about half the Liquor that remains in the Cucurbite: this is called the *Acid Spirit of Vitriol*, it is mixed in Juleps to an agreeable acidity.

That which remains in the Cucurbite is the most Acid part of the *Vitriol*, and is improperly called *Oyl*. It may be used like the *Acid Spirit*, for Continued Feavers, and other Distempers that are accompanied with a violent heat. This

This Oyl is likewise used for the dissolution of Metals.

You'll find in the Retort a *Cholcothar* that hath the same virtues with that I spoke of before.

Remarks.

To make the *Spirit of Vitriol* you must take *Green English Vitriol*, such as being rubbed upon Iron doth not at all change its colour, which shews it doth not partake of Copper, as the *German* does, that looks a little blewish, and is more acrimonious. You must Calcine it as I have said, to the end it being deprived of the greatest part of its *Phlegm*, the Distillation may be dispatched the sooner. A third part of the Retort is left empty, that the Spirits may find room to rarifie in, when they would come forth.

There Distills also a great deal of *Phlegm* into the Receiver, and all of it is known to have come, when there drops no more. Those who don't care for the *sulphurous Spirit*, do let it come forth, and mix together with the *Phlegm*, before the junctures are luted; but you must be sure to govern the Fire discreetly at that time; for these *Spirits* come forth with a great deal of violence, and use to break the Retort, when they are driven too impetuously. When they are out, you must augment the Fire to the last Degree of all, for the *Acid Spirit* will not part with the Earth, until it is forced by an extraordinary heat.

The

The Furnace in which this Operation is performed, must be very thick, that the heat of the fire being none of it lost through the Pores, may the better act upon the Retort. These *Spirits* do rarifie into white Vapours in the Receiver, which must be provided large enough, to give them free liberty to circulate in, before they condense into Liquor at bottom. The fire is usually continued four or five days together, but if after all that you should change the Receiver, and continue the fire three or four days longer, there would come forth an *Oil of Vitriol* congealed, and caustick, which is nothing but the more fixt part of the *Spirit of Vitriol*. And this Congelation hath given this Liquor the name of *Oil of Vitriol*, though improperly.

Vitriol contains earth enough, wherefore none is added to it, as is necessarily done in the *Distillation of Niter*.

Acid Spirits are Salts turned fluid by the force of fire, which hath disingaged them from their more terrestrious part, and they may be revived again by pouring them upon some Alkali; for example, the *Spirit of Vitriol* remaining some time upon *Iran*, doth reincorporate into *Vitriol*, and the *Spirit of Niter*, poured upon the *Salt of Tartar* makes a *Salt-peter*.

The *Spirit of Vitriol* taken in Juleps doth cool more than *Spirit of Salt*, because its points are keener, and do better pierce and fix the Volatile Alkali Salts, which are the things that by their immoderate motion do cause in our bodies that which is called heat; after which these fixed Salts do

do precipitate, and by a little acidity that remains still, do dilate the passages as they go, and work by Urine. Thus though an Acid is hot in its own nature, yet it cools almost always accidentally.

Styptick Water.

Take *Cholcothar*, or the *Red Vitriol* that remains in the Retort after the *spirit* is drawn out, *Burnt-Alom*, and *Sugar-Candy*, of each half a drachm, the *Urine* of a young person, and *Rose-water*, of each half an ounce, *Plantain-water* two ounces, stir it all together a good while in a Mortar, then pour the mixture into a Viol, and when you use it, separate it by Inclination.

If you lay a Bolster dipt in this Water upon an opened Artery, and hold your hand a while upon it, it stops the Bloud. In like manner you may wet a little Pledget in it, and thrust it into the Nose, when an Hemorrhagy continues too long; taken inwardly, it cures spitting of Bloud, Bloody Flux, and the immoderate Flux of the Hemorrhoids, or Terms, the Dose is from ten to twenty drops in Knot-grass water.

Remarks.

When the Bloud gushes forth too fast, you must redouble the first Bolster, that was put upon the wound, and assist it a little with your fingers for half an hour. The

The Basis of this Water is *Cholcothar*.

Having used this Water with good success upon several occasions, I was willing to insert it in this Book, and I believe if any body please to experiment it, as I have done, they'll easily acknowledge it to be an excellent Remedy in many Distempers.

Lapis Medicamentosus.

Powder and mix together *Cholcothar*, or the *Red Vitriol*, that remains in the Retort after Distillation, or in want of it *Vitriol Calcined to Redness* two ounces, *Litharge*, *Alom*, and *Bolus*, of each four ounces; put this mixture into a glazed pot, and pour upon it good *Vinegar* enough to cover the Matter two fingers high; cover the Pot and leave it two days in Digestion, then add to it eight ounces of *Niter*, two ounces of *sal Armoniack*; set the Pot over the fire, and evaporate all the moisture, Calcine the Mass that remains, about half an hour in a strong fire, and keep it for use. It is a good Remedy to stop *Gonorrheas*, a drachm of it is dissolved in eight ounces of Plantain water, or *Smith's water*, to make an Injection into the Yard; it is likewise good to cleanse the Eyes in the small Pox, seven or eight grains of it must be dissolved in four ounces of Plantain or Eye-bright water; it is also good to stop blood, applied outwardly on a Wound. It may be dissolved in Knot-grass water, and will go near to have the same effects as the *styptick water*.

Remarks.

Remarks.

This *stone* is called *Medicamentofus* by way of excellence, by reason of the good effects it produces.

The *Cholcothar*, that remains in the Retort after the Distillation of *Vitriol*, must be better than the others for this Operation; because being deprived of the greatest part of its Spirits, it is the more Astringent.

Litharge, which is a *Lead Calcined*, *Alom*, and *Bole-Armenick*, are so many considerable Astringents, that do no harm in this Composition.

Vinegar is put in to incorporate the ingredients together, and set them a Fermenting, after which *Niter* and *sal Armoniack* do easily mix among the rest.

The Calcination which is given to it at the end, is done to carry off some part of the Acid, and augment the Astriction: It likewise fixes the Stone the more, and makes it fitter to be kept.

It is one of the best Remedies I ever met with, for stopping *Gonorrhœas*, when it's a proper time to stop them by Injections.

Salt of Vitriol.

Take two or three pounds of the *Cholcothar*, that remains in the Retort after Distillation of
Vitriol,

Vitriol, let it lye in eight or ten Pints of warm water for ten or twelve hours; boil it a little while and let it settle; separate the water by Inclination, and pour new water upon the matter; proceed as before, and mixing your Impregnations evaporate all the moisture in a Sand-heat in a glass or earthen vessel, there will remain a salt at bottom.

It is used as the *Gilla Vitrioli*, to give a Vomit; the Dose is from ten to thirty grains.

Remarks.

This salt is that part of the *Vitriol* that the fire is not able to rarifie into *spirit*. Some Authors say, that it Vomits just after the same manner, as *Gilla Vitrioli*, taken in a smaller dose, but I have observed that its effect was much less, and on the contrary there was need of giving it in a larger dose than the *Gilla*, to procure a Vomit; for having given of it several times a drachm at a dose, the person had no Inclination at all to Vomit; and truly I am apt to believe that a *Fixt salt of Vitriol* divested of its *Sulphur*, doth rather tend to precipitate downwards than mount upwards; for Vomiting is caused by Saline *sulphurs*, that prick the Fibers of the Stomach, whence follows a Convulsion to this part.

That which remains indissoluble is called *Caput Mortuum*, it is used for Astringents.

If you expose it to the Air for a year, or a year and half, it returns into Vitriol again.

CHAP.

CHAP. XVIII.

Of Roche-Alom, and its Purification.

Roche-Alom is a very Styptick Mineral Salt, found in the veins of the earth in many places of *Europe*; it is taken up in great transparent pieces, the best is that which is reddish, for the white contains fewer Spirits.

Alom is purified after the same manner as *Vitriol*; it is used to cleanse the teeth; a drachm of it is dissolved in a quart of water, and a glass of it is given now and then.

Many things are likewise called by the name of *Alom*, as the *Saccharinum*, which resembles Sugar, it is nothing but a mixture of *Roche-Alom*, *Rose-water*, and the *White* of an *Egg*. *Plume-Alom*, which some call *Lapis Amianthus*, is a kind of *Talk*.

Distillation of Alom.

Put five pounds of *Roche-Alom* into a glass or earthen Cucurbite, and fitting to it a Head with its Receiver, distil in a sand-fire as much as will rise, you'll have a *Phlegm of Alom* that is used for Distempers of the Eyes, for Quinsies, and to cleanse Wounds: unlute the Vessels, break the
Cucur-

Cucurbite, and powder the white Mass that remains in it, put it in an Earthen Retort half empty; place your Retort in a Reverberatory Furnace, and fitting to it a large Receiver, lute the junctures close, and light a very small fire the first three hours only to warm the Retort, afterwards increase it every hour to the utmost violence, and these Spirits will come forth, and fill the Receiver with white Clouds; continue the fire in this condition three days together, then let the Vessels cool: you'll find in the Receiver an Acid Spirit, that you may rectifie by distilling it in a glass Limbeck in a sand-fire, to render it the clearer. This Acid is more disagreeable than that of *Vitriol*, it is used in Juleps for continued Feavers, and Tertian Agues; the Dose is from four to eight drops; it is likewise good to cure the *Aphthæ*, or little Chancres that come in the mouth.

Break the Retort, and you'll find in it a white Mass very much rarified, and light, it is called *Burnt Alom*, or *Calcined Alom*, it is used to eat up carnous excrescences, or proud flesh.

Remarks.

The *Distillation of Alom* must be performed like that of *Vitriol*, that is to say, without addition of Earth, because these Salts do contain enough of it.

The Cucurbite in which you put your *Alom* must be sure to be large enough, because it rarifies extreamly.

The

The *Phlegm* is known to be all come forth, when there Distils no more; for these Spirits being very weighty do require a greater heat than that of Sand to bring them out.

If a Drachm of *Alom* be dissolved in six ounces of this *Phlegm*, you make an excellent *Alom water* to cleanse Wounds and Ulcers.

The Mass that remains in the Cucurbite, or *Dephlegmated Alom*, is more Escarotick than that which hath lost its Spirits.

Chirurgions are wont to make the Calcination of *Alom* in a Frying-Pan; but the Iron dulls its vertue, as absorbing its Spirits wherein consists the corrosion of *Alom*; the Retort must be filled but half full, because there happen *Ebullitions*, which do require room enough.

CHAP. XIX.

Of Sulphur.

Sulphur is a kind of *Bitumen*, that's found in many places in *Italy* and *Spain*. There's brought among us both *Natural* and *Artificial*; the *Natural* is Greyish, and called *Sulphur Vivum*, the other is Yellow, and is nothing but the *Natural* melted, purified from its grosser earth and formed into Rows, that we commonly use.

P

Some

Some think that *Sulphur* is a *Vitriol* sublimed in the Earth, because these mixts are very often found near one another; that there is a great deal of *Sulphur* in the Mass of *Mineral Vitriol*, and that the Acid Spirits which are drawn from them both are wholly alike.

Flower of Sulphur.

Put about half a Pound of *Sulphur* grossly powdered into a glass Cucurbite, place it in a small open fire, and cover it with a Pot or Cucurbite turned up-side down, that's unglazed, so as that the neck of the one may enter into the neck of the other. Change the upper Cucurbite every half hour, fitting another in its place; add likewise new *Sulphur*; gather your *Flowers* that you find stuck in the Cucurbite, and continue to do thus, until you have got as much as you desire. Then take away the fire and let the Vessels cool, there will remain at bottom only a little light insignificant Earth.

The *Flower of Sulphur* is used in Diseases of the Lungs, and Breast, the Dose is from ten to thirty grains in Lozenges, or Electuary. It is used also in Unguents for the Itch.

Remarks.

This Operation is intended only to rarifie the *Sulphur*, that being rendred more open, it may work the better.

Sulphur

Sulphur is proper against Infirmities of the Lungs, when they proceed from a Viscosity that sticks to them, because it is able to deterge; but if it should be given to such as are too much dried up with a Fever, it proves very unhappy, in that it raises a greater motion of the humors: it cures Tettars, and the Itch, because opening the Pores it drives out the subtler part of the humor, but yet the grosser remaining within, they do frequently return again.

Magistry of Sulphur.

Take four ounces of the *Flower of Sulphur*, and twelve ounces of the *Salt of Tartar*, or *Salt-peter fixed* by the coals: put them into a large glazed Pot, and pour upon them six or seven pints of Water. Cover the Pot, and placing it upon the fire, make the Matter boil five or six hours, or until being turned Red, the *Sulphur* is all dissolved. Then filtrate the Dissolution and pour upon it by little and little *Distilled Vinegar*, or some other Acid, there will presently appear a Milk, let it settle, that a White Powder may precipitate to the bottom of the Vessel; pour off by Inclination that which is clear, and washing this Powder five or six times with water, dry it in the shade, and this is called the *Magistry* or *Milk of Sulphur*; it is thought good for all Diseases of the Lungs, or Breast; the Dose is from six to sixteen grains in some convenient Liquor.

Remarks.

Water all alone is not able to dissolve such a gross body as *Sulphur*; wherefore an Alkali Salt is added to divide it into small imperceptible particles.

The Acid Liquor pierces the Alkali, and by separating its parts makes it let go its hold, so that the *Sulphur* gathers it self together, and falls down to the bottom in a white Powder. This Powder is washed to take away the impressi^on of the Salt of *Tartar*, and the Acid that might remain among it, after which it may be said to be a *Flower of Sulphur Alcoholised*.

You must have a care not to let there be any Silver Vessel where this Operation is performed, because the vapour which proceeds from *Sulphur* will make it black.

Fifteen grains of this Powder will do as much as double the quantity of *Flower of Sulphur*, for Disca^oes of the Breast, and it doth not heat so much.

Balsom of Sulphur.

Put into a small Matra^{ss} an ounce and a half of *Flower of Sulphur*, and pour upon it eight ounces of *Oyl of Turpentine*; place your Matra^{ss} in Sand, and give it a Digesting fire two Hours; afterwards encrease it a little for four Hours, and
the

the Oyl will take a Red Colour ; let the vessel cool , then separate the clear *Balsom* from the *Sulphur* that could not dissolve. This *Balsom* is excellent for Ulcers of the Lungs and Breast ; the Dose is from one drop to six in some appropriate Liquor.

This *Balsom* may be brought into the consistence of an Unguent, by evaporating some part of the moisture over the fire, and it is thus used to cleanse Wounds and Ulcers.

To make the *Aniseed Balsom of Sulphur*, you must use the Oyl drawn from *Aniseed* instead of the Oyl of *Turpentine* , and proceed as I have said ; it is more agreeable than the former, and is not so pungent.

Remarks.

There is no need of a great fire for this Operation, because *Sulphur* being a fat body doth easily incorporate with Oyls, and commonly gives them a Red Colour. When you would have this *Balsom* taken in Potion, you must dissolve it in a little Yelk of an Egg, that it may mix in Waters, or Broths.

A *Balsom of Sulphur* may be likewise made with Oyl of *Linseed*, instead of the Oyl of *Turpentine*, for Wounds.

Spirit of Sulphur.

Provide a great Earthen Pan, and set in the middle of it a little Earthen Cup turn'd upside down, and then another Cup on this filled with melted *Sulphur*; cover both these Cups with a great Glass Funnel made on purpose, with a neck as long as that of a Matraass, and the bigness of a thumb; fire the *Sulphur*, and do not stop the hole of the Funnel, but let Ayr come in there to advance its burning, for it would otherwise quench. When your *Sulphur* is spent, put new in its place, and continue to do so until you find under the lower Cup as much Spirit as you need, keep it in a Viol.

It is put into Juleps to give an agreeable acidity, and qualifie the heat of Continued Feavers, and is good for Infirmities of the Lungs.

Remarks.

A great many *Machines* have been invented to draw the *Spirit of Sulphur*; the ordinary one is the *Glass Bell*, under which the *Brimstone* is burnt, and the *Spirits* coagulating against its sides distill into the Earthen Pan, that is set underneath, after the very same manner as I have shewed in the description of my *Machine*.

Now you must leave an empty space between the brims of the *Bell*, and the *Pan*, that the Fire may

may have Ayr enough to keep it lighted; but besides that the Fire is apt to go out every moment, use never so much precaution, a very poor quantity of Spirit is drawn this way.

Authors do recommend this Operation to be done when the Weather's moist, and to moisten the Bell before-hand, but I have found by Experience that these circumstances signified nothing at all.

With the *Machine* that I have described I can make a shift to draw a good handsome quantity of *Spirit*, and I am not forced to fire the *Sulphur* several times; because the hole at top gives vent to the Ayr, and hinders it from quenching: Again, the more Phlegmatick part evaporates that way, but the Acid Spirit not being able to rise so high, condenses against the sides of the Funnel, and then falls down under the little Cup that's turn'd upside down, to raise the other up higher.

This *Spirit* is nothing but a *Vitriolick Salt* dissolved, that differs little from the *Spirit of Vitriol*, besides in the Taste, which is not so Emphyreumatical, as not having undergone so violent a Fire.

C H A P. XX.

Of *Succinum* or *Amber*.

THere's found in small currents near the Sea, a certain coagulated *Bitumen*, which, because it resembles some juyce of the Earth is called *Succinum*, and *Carabè*, because it will attract straws; it is likewise called *Electrum*, *Glessum*, *Ambra Citrina*, vulgarly *Yellow Amber*.

This *Bitumen* being soft and viscous, several little Animals, such as Flies, and Ants, do stick to it, and are there buried.

Amber is of different colours, such as *White*, *Yellow*, *Pale*, and *Black*. The *White* is most esteemed, though it is no better than the *Yellow*. The *Black* hath the least virtue of all.

Amber serves to stop spitting of Blood, the Bloody-Flux, the immoderate Flux of the Hemorrhoids, Terms, and Gonorrheas: the Dose is from ten grains to half a drachm. It is likewise used to stop a little the violence of Catarrhs, by receiving the fume of it at the Nose.

Distillation

*Distillation of Amber, and the Rectification
of its Oyl, and Spirit.*

Fill with *Amber* grossly beaten two thirds of an Earthen Retort, or Glass one luted; place it in a Furnace, on two Iron Bars; fit to it a large Receiver, and luting the junctures close, give under it a small Fire to warm the Retort, and drive out the *Phlegm*. Afterwards augment it by little and little, there will come forth a *Spirit*, and an *Oyl*; continue the Fire until there comes no more; then let the Vessels cool, and unlute them. Pour about a pint of warm Water into the Receiver, and stirring it soundly about, for to dissolve some Volatile Salt that often sticks to the sides of the Receiver, pour all the Liquor into a Glass Limbeck; fit to it a Receiver, and luting well the junctures, make a small Fire to warm the Vessel, then augment it a little, the Water and Spirit will rise, and carry with them a little white Oyl; continue the Fire, until there rises no more, and the thick Oyl remains at bottom of the Cucurbite without boiling: separate the white Oyl that swims above the Spirit and Phlegm, and keep it in a Viol well stopt; it is given inwardly in Hysterical Distempers, in the Palsie, Apoplexy, and Epilepsie; the Dose is from one drop to four in some appropriate Liquor: it may be mixed with a little Yelk of an Egg, to dissolve it easily in Water or Broth.

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The Water and Spirit remain mixed confusedly together, now to separate them you must pour this mixture into an Earthen or Glass Dish, and evaporate over a very gentle Fire two thirds of the moisture; that which remains is the *Spirit of Amber*, keep it in a Viol well stopt.

It is an excellent Aperitive, and is given in the Jaundise, Stoppage of Urine, Ulcers of the Neck of the Bladder, and in the Scurvy; the Dose is from ten to four and twenty drops in some convenient Liquor.

The *Black Oyl* which remains in the Cucurbite may be kept apart for outward uses, to chafe the Nose and Wrist of Women in Hysterical Maladies.

If you would rectifie it, you must mix it with so much Sand as is necessary to make a Paste, and put it into a Retort, and placing it in a Furnace in a naked Fire distill all the Oyl; the first that comes forth will be red, but exceeding clear, keep it by its self, and it may serve instead of the white.

The *Oyl of Jet* may be drawn as the *Oyl of Amber*, but seeing *Jet* is more terrestrious, it requires a stronger Fire.

Remarks.

That which is called *Spirit of Amber* is only a *Volatile Salt* dissolved in a little *Phlegm*.

Some Authors pretend, that putting this *Spirit* into a *Matrafs* with a *Blind-Head*, they can sublime

lime a *Volatile Salt* from it as from *Animals*, but I could never find Experience answer their pretences; for after having followed them several times in this Operation, I could never gain one jot of that Salt, which hath given me occasion to examine this Spirit, and enquire what kind of Salt it might really contain.

I found this *Salt* was *Acid*, and like unto that of Plants which is called *Essential*, whereof I have spoken in the Principles. This Salt being less Volatile than that of Animals, cannot rise so high, besides that it is heavier than the Phlegm which must rise before it. Wherefore to separate it, you must evaporate about a third of the moisture that is in the Spirit, over a very gentle fire, and then put the remainder into a cool place, and leave it there ten or twelve days without stirring it, you'll find little Crystals that you may take and keep in a Viol well stop'd. This *Salt* hath the same virtues as the *Spirit*: the Dose is from eight grains to sixteen, in Raddish, or Pelitory water; but it is better to keep it in the *Spirit*, for besides that it is more easily preserved so, there always flies away some part of it with the Phlegm in the evaporation, let the fire be never so moderate.

C H A P. XXI.

Of Amber-Grease.

A *Mber-Grease* is a *Bitumen* found in many places on the Sea-shore, but especially in the *Indies*; it grows hard in the Sun-beams. The best is that which is very gray, and dry, and easily softens in the heat; when it is moist, it appears black.

Amber-Grease is an excellent Corroborative, it is given in some Liquor or Electuary to provoke Seed: the Dose is from one grain to four.

Essence of Amber-Grease.

Take two drachms of good *Amber-Grease*, so much *Sugar Candy*, half a drachm of *Musk*, and two grains of *Civet*; beat them small together, and put the mixture into a Viol: pour upon it four ounces of *Spirit of Wine* well *Alcoholized*. Stop the Viol close, and set it in Digestion in Horse-dung four Days time; then taking it out separate that which is clear, while it is warm, for it will congeal when it grows cold. This *Essence* works more strongly than *Amber-Grease* in substance; the Dose is from six to twelve drops in some convenient Liquor.

Remarks.

Remarks.

Amber-Grease alone hath scarce any smell at all, but when its parts are set in motion by means of Fermentation, Sulphurs do rise from it which tickle the sense of Smelling with a great deal of pleasure; the addition of *Musk* and *Civet* have a good effect; as for the *Sugar Candy*, it serves only to separate the rest, that they may be the easilier powdered and dissolved: for this Tincture is only a dissolution of these Sulphurous Parts in the Spirit of Wine.

The terrestrious part which remains at bottom may be used in sweet Powders.



THE
SECOND PART.
Of Vegetables.

CHAP. I.

Of Jalap.

Jalap is a Greyish root brought out of *America*, cut into slices, and dried; it grows in the *Province of Mechoacan*, and several other places; the best is that which is most compact, and filled with Rosinous veins. It purges watery Humors very well, and is therefore usually given in the Dropsie and Gout: the Dose is from ten grains to a Drachm in Broth, or White-wine.

Rosine, or Magistery of Jalap.

Put a pound of good *Jalap* grossly powdered into a large Matraass; pour upon it *Spirit of Wine Alcoholized*, until it is four fingers above the
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the Matter: Stop the Matrafs with another whose neck enters into it, and luting the junctures with a wet bladder, digest it three days in a Sand-heat, the Spirit of Wine will receive a Red Tincture: pour it off by Inclination, and then pour more upon the *Salap*; proceed as before, and mixing your dissolutions filtrate them through Brown paper. Put that which you have filtered into a Glass-Cucurbite, and distill in a vaporous Bath two thirds of the Spirit of Wine, which may serve you another time for the same Operation. Pour that which remains at the bottom of the Cucurbite into a large earthen Pan, filled with water, and it will turn into a Milk, that you must leave a day to settle, and then separate the water by Inclination, you'll find the *Rosine* at bottom like unto Turpentine. Wash it several times with water, and dry it in the Sun, it will grow hard like *Rosine*; powder it fine, and it will become White. Keep it in a Viol, it purges Serosities. It is given in Dropfies, and for all manner of Obstructions: the Dose is from four to twelve grains, mixt with an Electuary, or else in Pills.

The *Rosines* of *Turbith*, *Scammony*, and *Benjamin*, may be drawn the same way.

Remarks.

The *Spirit of Wine*, which is a Sulphur, is likewise a very convenient *Menstruum* to extract *Rosines*, which are gross Sulphurs; you must use

use enough Spirit to dissolve all the *Rosine*, and give it a sufficient time to penetrate all the body of the *Galap*, after which a good part of the *Spirit of Wine* is drawn off, and may serve for the same use again, provided you distil it over a very gentle fire; for if you let it be too strong, it will carry away along with it good part of the *Rosine*.

A great deal of water is poured upon it, to weaken the Spirit of Wine, which held the *Rosine* dissolved; and then it revives again, and its parts uniting together, there happens a kind of Milk, which clears up, according as the *Rosine* precipitates.

Some do evaporate the Spirit of Wine, and without using any Precipitation, they find their *Rosine* in an *Extract* at the bottom of the Vessel, but then it grows black.

All the Purgative virtue of the *Galap* consists in the *Rosine*: an Alkali Salt may be drawn from the Residence, but in a very small quantity.

You must observe to give the *Rosine of Galap* always mixt with something else that may separate its parts; for if it were taken alone, it might be apt to adhere to the inward Membrane of the Intestines, and so cause Ulcers by its Acrimonious quality.

Moreover *Apothecaries* should observe to mix it in a little Yolk of an Egg, when they would dissolve it in a Potion, for it sticks to the Mortar like Turpentine, when it is humected by any Aqueous Liquor. It may be likewise incorporated with some Electuary, and then it easily dissolves.

Twelve grains of this *Rosine* work the same effect, as a Drachm of *Galap* in substance.

It is not yet sufficiently known wherein the Purgative virtue of Mixts doth consist, to give it a right explication. It is easily conceived that these effects are a consequence of the Fermentation that the Remedy hath caused; but no body can find what it is that makes this Remedy be Purgative rather than several others, which seem to have as great a disposition as this to cause such a Fermentation; wherefore I shall not pretend to give a clear understanding of this *Phanomenon*. I shall only endeavour to give some reason for a very considerable difficulty, which is to know how it is that *Hydragogues* do work in bodies, and why they rather purge Waters than other humors.

A general reason that may be given of it is that all *Hydragogue Remedies* have more Acrimony than other Purgatives, and consequently they are better able to open and penetrate the Lymphatick Vessels.

But it may be further said that these Remedies do so cut and attenuate the Viscosities which are found in bodies, that they render them like unto Water. And there's no difficulty in conceiving this last reason, when it is considered, that these Remedies which do Purge water, are all of them Rosinous, or else Salts; for after the same manner as we see Sulphurs, or Liquified Salts dissolve Sulphurous Bodies, so do Rosines, which are Sulphurs and Salts, dissolve Viscosities in the body, which are compounded of a great deal of Sulphur.

But

But there is this difference between the effects of *Salt*, and of *Rosines*, that the *Salt* passing quick, and making but little impression, doth dissolve only that which is found in what is called the first Region of the body, wherefore it purges but mildly; whereas the *Rosine* by reason of its Viscous, hooked parts, remains a longer time in the body, and at leasure causes a Fermentation not only about the parts where it immediately works, but moves the Brain, and other remote places, from whence it forces Phlegm to stream into the Belly, and this is that which causes Rosinous Hydragogues to purge more than Salts.

CHAP. II.

Of Rhubarb.

Rhubarb is a Purgative Root, brought from *China*. It takes its name from *Barbary*, where it hath grown abundantly; it is likewise called *Rheum*. The best sort is that which being broke appears of a Nutmeg Colour within; its use and vertues being sufficiently known to every body, I shall not enlarge in describing them.

Extract of Rhubarb.

Slice six or eight ounces of good *Rhubarb*, and steep it twelve hours warm in a sufficient quantity of *Succory Water*, so as the Water may be four fingers above the *Rhubarb*; let it just boil, and pass the Liquor through a cloth; infuse the Residue in so much more *Succory Water*, as before, then strain the Infusion, and express it strongly: mix your Impregnations, or Tinctures, and let them settle; filtrate them, and consume the moisture in a glass Vessel, over a very gentle fire, until there remains a Matter that hath the consistence of thick honey, this is called *Extract of Rhubarb*, keep it in a Pot.

The Dose is from Ten Grains to two Scruples in Pills, or dissolved in *Succory water* for Diseases of the Liver and Spleen, it binds as it purges.

The *Extracts* of all *Vegetables* are made after the same manner, except the Rosinous, whereof I have spoken. Likewise waters may be used for *Menstruums*, that are appropriated to the virtue of the Mixt, whose *Extract* you intend to draw.

When you draw the *Extract* of *Aromatick* bodies, such as *Roses*, and *Cinnamon*, the humidity may be distilled rather than evaporated, whereby you gain a fragrant water.

Remarks.

Remarks.

Though the name of *Extract* ought to be very diffusive in Physick, it is confined only to one sort of Preparation that is reduced to the consistence of an Electuary, it is nothing else but a Purification that is made to cleanse a Mixt from its more Terrestrious parts, that being more open and free it may work the more forcibly. Now this Operation is good for Mixts that are not Odoriferous, but not so for those that are; for by Evaporation their best part is carried away: which consists in a Volatile. So that I would by no means advise any body to make the *Extract* of *Aromatics*. Nature is a very good Artist to perform this Operation within our bodies, when the Principles are easie to separate, as in these sorts of Mixts.

There was a great contest among Chymists heretofore, in which of the Principles it is that the Purgative virtue of many Remedies doth consist. Some maintained it to be in the Salt, others in the Sulphur, and others again in the Mercury. But when every part had very diligently separated each their Principle, and came to try it, they found after all that none of them was Purgative; which hath perswaded many of them to think that this Purgative was of so subtle and penetrating a nature, that glass it self was not able to keep it from being lost in the tryal.

For my part I cannot grant any such imperceptible Purgative; and I rather am apt to believe that the Purgative virtue of a Mixt consists in nothing else but such a different mixture of Principles as is requisite to produce certain Fermentations in our Bodies. So that when once we separate the Sulphur, Mercury, or Salt, the position of parts, or proportion of Principles being changed, there remains no longer any Purgative effect, because the Principles being separated can no more produce that Fermentation which they did while they were mixed, and united together some kind of way that Art is ignorant how to imitate.

Perhaps some who think themselves extream Criticks will be apt to say this Chapter contradicts the former; for I there maintained that the Rosine of Jalap, which is a Sulphur, doth contain all the Purgative virtue of Jalap; but though I did call the Rosine of Jalap a Sulphur, I did not mean it was purely a Sulphur, it is a substance out of which all the five Principles may be still drawn; but by reason it doth contain great store of Sulphur, this name may be given to it as it often is to others of the like nature.

And thus Salt may be said to be somewhat Purgative too; but it doth not follow from thence that Salt alone must be esteemed to contain all the Purgative virtue of Mixt bodies; seeing that many Plants, such as *Guayac*, *Bex*, *Carduus*, and *Wormwood*, do contain as much, or more Salt, than *Senna*, and *Rhubarb*, and yet nevertheless they do not purge at all.

CHAP.

C H A P. III.

Of the Wood Guaiacum.

Guaiacum called *Lignum Sanctum* is the Wood of a large Tree that grows in a great many places in the *West Indies*. It is likewise cultivated here in *Europe*, in *Languedoc* is good store, but that which is brought out of Hot Countries is best esteemed; this Wood is very much in use in Sudorifick Decoctions; the Bark is also used, and the Gum that runs from it: the best *Guaiacum* is that which is most compact.

Distillation of Guaiacum.

Take shavings, or pieces of *Guaiacum*, fill a large Retort with 'em three quarters full, place it in a Reverberatory Furnace, and joyn to it a great capacious Receiver. Begin the Distillation with a fire of the first degree, to warm the Retort gently, and distill the Water, which is called Phlegm; continue it in this condition, until there come no more drops, which is a sign that all the Phlegm is distilled. Throw away that which you find in the Receiver, and fitting it again to the Neck of the Retort, lute well the junctures.

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You must afterwards encrease the fire by degrees, and the Spirits, and Oyl, will come forth in white Clouds ; continue the fire until there comes no more, let the vessels cool, and so unlute them; pour that which is in the Receiver into a Funnel lined with brown Paper, set upon a Bottle, or some other vessel, the Spirit will pass through, and leave the black, thick, and very fetid Oyl, in the Funnel ; pour it into a viol, and keep it for use ; it is an excellent Remedy for rottenness of Bones, for the Tooth-ach, and to cleanse old Ulcers. It may be rectified as I said of the Oyl of *Amber*, and may be used inwardly in the Epilepsie, palsie, and to drive out the After-birth : the Dose is from two drops to six.

The Spirit of *Guaiaicum* may be rectified by distilling it in a Limbeck, for to separate a little impurity that might remain in it ; it drives the humours by transpiration, and works by Urine : the Dose is from half a drachm to a drachm and a half. It is likewise used mixt with the Water of Honey, to cleanse inveterate Ulcers.

You'll find in the Retort the Coals of *Guaiaicum*, which you may turn into ashes by putting fire to 'em, which they will take sooner than other Coals : Calcine these Ashes some Hours in a Potters Furnace, then make a *Lixivium* of them with Water, which being filtred, evaporate the humidity in a Glass or Earthen vessel in a Sand-fire ; there will remain the *Salt* of *Guaiaicum*, which you may whiten by Calcining it in a Crucible over a strong fire. This Salt is Aperitive, and Sudorifick ; it may serve as all other Alkalis

to draw the Tincture of Vegetables : the Dose is from ten grains to half a drachm in some convenient Liquor.

The Earth, called *Caput Mortuum*, is good for nothing.

After this manner the five substances of all Vegetables may be drawn ; but because the fire doth leave them an ungrateful Empyreumatical smell, other ways have been invented to draw out the Oyl of Aromaticks : I shall describe them in the sequel.

Remarks.

The Oyl of *Guaiacum* is acrimonious by reason of the Salts it carries along with it ; and it is the gravity of these Salts that does precipitate it to the bottom of the Water. The Oyl of Box, and most others that are drawn this same way, do the like.

That which is called Spirit of *Guaiacum* is nothing but a dissolution of the Essential Salt of the Plant in a little Phlegm.

The Fixt Salt is an Alkali that works much like others of that kind, nevertheless it is very probable that the Fixt Salts of Vegetables, let 'em be never so much Calcined, do always retain some particular virtue of the Plant they were drawn from.

If one would take the pains to Calcine the Earth that remains, he would obtain a Salt, though but very little of it.

C H A P. IV.

Of Cinnamon.

C*innamon* is the Bark of a Tree as large as an Olive Tree, it grows in the *East-Indies*, and is much like that which is taken from the *Cassia Lignea*, but it is not the very same, as some will needs think; the best *Cinnamon* is that which smells strongest, is quick upon the tast, and of a reddish colour.

The *Cassia Lignea* differs from *Cinnamon*, in that it is not so quick upon the tast, smells not so strong, and becomes mucilaginous in the Mouth when it is chewed, which *Cinnamon* doth not do.

Oyl, or Essence of Cinnamon, and its Cælestial Water.

Bruise four Pounds of good Cinnamon, and infuse it in six quarts, or twelve pounds of Water, add to it eight ounces of Salt-peter; leave it in Digestion in an earthen vessel well stopt for two days: pour the Infusion into a large Copper-Limbeck, and fitting a Receiver to it, and luting close the junctures with a wet Bladder, distill
with

with a pretty good Fire three or four Pints of the Liquor, then unlute the Limbeck, and pour into it by Inclination the Distilled Water, you'll find at bottom a little Oyl that you must pour into a Vial, and stop it up close. Distill the Liquor as before, then returning the Water into the Limbeck, take the Oyl you find in the bottom of the Receiver, and mix it with the first: Repeat this Cohobation until there rises no more Oyl; then weaken the Fire, and distill the Water that remains in the Receiver, the same way I shall shew hereafter to rectifie *Aqua-vita* into the Spirit of Wine, you'll have an excellent spirituous Cinnamon-Water.

The Oyl of Cinnamon is an admirable Corroborative; it strengthens the Stomach, and assists nature in her evacuations. It is given to make Women deliver easily, and to bring their Terms; it likewise provokes Seed; a drop of it is commonly mixed in a little Sugar-Candy to make the *Oleo saccharum*, which is easily dissolved in Cordial, or Hysterical Waters.

The spirituous Water of Cinnamon hath the same virtues, but two or three drachms are requisite for a Dose.

After this manner almost all the Oyls of Odoriferous Vegetables may be drawn, such as those of Box, Roses, Rosemary, Lavender, Juniper, Cloves, and Anis-seed, which do either swim above the Water, or fall to the bottom, according as they are more or less loaded with Salts.

Remarks.

Remarks.

Salt-peter is put into the Infusion of *Cinnamon*, that it being opened the better, may render its Oyl the easier. You must make the fire strong enough, for if there is not a sufficient heat, the Oyl will not rise at all.

The Cohobation serves to open the Body the more, that the Oyl may compleat its separation.

Cinnamon yields less Oyl than other Woods, or Barks, and it is a very difficult business to draw six drachms of it out of four Pounds, let it be never so good.

The Spirituous Water of *Cinnamon* is nothing but a rarified Oyl, whose parts are separated in the Water by Fermentation, so as they become imperceptible: they do make what is called a volatile Spirit, which easily mixes with all sorts of Liquors, as doth the *Oleo saccharum*; for the *Oleo saccharum* is properly an Oyl, whose parts being separated in the Sugar, do easily mix in Waters.

Tincture of Cinnamon.

Take what quantity of bruised *Cinnamon* you please, put it into a Matrafs, and pour upon it *Spirit of Wine* one finger above it; stop your Matrafs close, and set it in Digestion in Horse-dung

ding four or five days, the *Spirit of Wine* will be impregnated with the *Tincture of Cinnamon*, and become red; separate it from the *Cinnamon*, and after 'tis filtred, keep this *Tincture* in a viol well stopt; it is an admirable Cardiack, it fortifies the Stomach, and rejoyces all the vital parts: it may be used like *Cinnamon Water*, in a smaller Dose.

After this manner the *Tincture* of all Odoriferous Vegetables may be drawn.

CHAP. V.

Of Cloves.

C*loves* are the fruit of a Tree as big as the *Laurel Tree*, its Bark is very much like *Cinnamon*, but tastes like the fruit; it grows in many places in the *Indies*; 'tis an admirable stomachick, held in the Mouth it preserves from the contagion of ill Ayr.

Oyl of Cloves per Descensum.

Take several large drinking Glasses, cover them with a Linnen-cloth, and tye it round each of them, leaving a cavity in each Cloth to put the powdered

powdered Cloves into ; set a small Earthen Cup upon each Glass of these *Cloves*, let it stop so fitly that it may suffer no Ayr to enter between its brim and that of the Glass : fill these Cups with hot ashes, to warm the Cloves, and distill down to the bottom of the Glass first a little Phlegm and Spirit, and after that a clear and white Oyl ; continue the Fire until there falls no more, separate the Oyl in a Tunnel lined with a Cornet of brown Paper, and keep it in a Viol well stoppt.

Some drops of it are with Cotton put into an aking Tooth ; It is likewise good in Malignant Feavers, and the Plague : the Dose is two or three drops in Balm-water, or some appropriate Liquor.

Remarks.

I have given this Preparation to serve you upon an emergence when you want in hast the *Oyl of Cloves*, you must only use hot ashes to warm the *Cloves*, if you desire to have a white Oyl, for if you give a greater heat, the Oyl turns Red, and loses good part. You must also take care to lift up the Cup from time to time, to stir about the powder of *Cloves*. The *Oyl of Cloves* may be likewise drawn, if you please, like the *Oyl of Cinnamon*.

C H A P. VI.

Of Nutmegs.

Nutmeg is the fruit of a Tree as big as a Pear-Tree, which grows in the Isle *Banda* in the *West-Indies*. It is called *Nucista*, *Nux Moschata*, *Myristica*, *Unguentaria*, and *Aromatites*. While it is green, it is clothed with two Barks, but when it comes to maturity, the uppermost chaps, and lets the second appear, which is tender, and very fragrant. This last Bark is called *Macis*, and improperly the *Flower of Nutmegs*.

The best *Nutmeg* is that which is most weighty; it is mixed in Carminative, and Hysterical Remedies.

Sometimes a sort of *Nutmegs*, called *Male-Nutmeg*, is found at the Druggists, which differs from the common sort, in that it is longer, and weaker.

Oyl of Nutmeg.

Take two pounds of good *Nutmegs*, beat them in a Mortar, until they are almost in a Past, and put them upon a Cloth; cover them with a piece of strong Cloth, and an Earthen Pan over it; put
your

your Cloth upon a Kettle half filled with Water, and set the Kettle over the Fire, that the vapour of the Water may gently warm the *Nutmegs*; when you shall find upon touching the Pan, that it is so hot you can't endure your hand upon it, you must take off the Cloth, and putting the Matter into Linnen, take its four corners, and tye them quickly together; put them into a Press between a couple of warm plates, set the Pan underneath, and there will come forth an Oyl which congeals as it grows cold: Express the matter as strong as you are able, to draw out all the Oyl; then keep it in a Pot well stopt; this Oyl is very Stomachical, being applyed outwardly, or else given inwardly. The Dose is from four grains to ten in Broth, or some more convenient Liquor. It is commonly mixed with Oyl of *Mastich*, to chase the Region of the Stomach. And this way the green Oyls of Anis, Fennil, Dill, and Mace, may be drawn.

Remarks.

The *Nutmegs* must be well beaten, or else they would yield less Oyl; this way of warming 'em is called the *Vaporous Bath*.

The ordinary Method is to heat the *Nutmegs* in a Kettle, and then express them strongly, but seeing the warming them that way carries off a great deal of its Volatile parts, the Oyl never proves so good, as when made with the circumstances I have mentioned; for thus the Matter
warms

warms insensibly by the vapour of the Water, and alters not its vertue in the least; and if any Water doth mix with the *Nutmegs*, it is easily separated from the Oyl. They who desire to have it very fragrant, may set it over a Vessel of Wine instead of Water.

The Oyls of Almonds, Wallnuts, Cold Seeds, Hazle-Nuts, Poppy, and Behen, must be only beaten, and so put into the Press, without warming, because they do yield their Oyls very easily, and seeing these Oyls are often taken inwardly, it is better draw them without the help of fire, to avoid the Empyreumatical impression it would be apt to leave them.

CHAP. VII.

Distillation of an Odoriferous Plant, such as Balm, its Extract, and Fixt Salt.

TAKE a good quantity of *Balm* new gathered, when it is in its vigour; beat it well in a Mortar, and put it into a large earthen Vessel; pour upon it boiling water enough to moisten it well, and leave it two daies in digestion; then turn the Matter into a large *Copper Vesica*, and cover it with its Refrigeratory, or Head, Tin'd o'th' the inside: set it in a Furnace, and fitting

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to it a Receiver lute the junctures with a wet bladder; make a fire of the second degree under it, and distil about half the water you poured upon the *Balm*, then let the Vessels cool, and unlute them: You'll find in the Receiver a very good *Balm-water*, put it into a bottle, and expose it to the Sun five or six days open, then stop it, and keep it for use. It is used in Hysterical Maladies, in the Palsie, Apoplexy, and Malignant Feavers, it is given from two to six ounces.

Express through a Linnen cloth strongly that which remains in the Body, and let the Expression settle; filter it, and evaporate the moisture over a gentle heat in an Earthen vessel, until there remains an Extract in the consistence of thick Honey. 'Tis a good Remedy for such Diseases as proceed from corrupt Humors, it drives them out by Transpiration, or by Urine: the Dose is from a Scruple to a Drachm, dissolved in its proper Water.

Dry the Residue that remains after expression, and burn it with good store of other *Balm* dried too, you may obtain an Alkali Salt from the Ashes by a *Lixivium*, the same way I spoke of concerning the Salt of *Guaiacum*.

This Salt is Aperitive, and Sudorifick, the Dose is from ten grains to a Scruple in *Balm-water*.

The Water, Extract, and Salt of all Odoriferous Plants, such as *Sage*, *Marjoram*, *Tyme*, *Mint*, *Hyssop*, &c. may be drawn after the same method.

Remarks.

Remarks.

Perhaps some will think it strange that I add water for the Distillation of *Balm*, but those who use to work on this sort of Herbs do know well enough, that being dry substances of themselves, there's no good Distilling 'em without first wetting them; and moreover the water that is added doth only serve to imbibe the Volatile parts, as the Fermentation operates; and when the matter heats, the more spirituous part as being the lighter rises first, and favours ~~its~~ of the *Empyreuma*, than if the Herb were Distilled without first wetting of it.

You must observe in these Distillations to give a fire from the Second to the Third degree, because if it were made too little, none of the Essential or Volatile Salt of the Plant would rise; and if it were too strong, the Water would taste of the *Empyreume*: Wherefore to make a good Distillation, you must let one drop succeed another slowly.

The Waters as soon as they are Distilled, have commonly no great smell, but when they have lain some time in the Sun, their spirituous parts that were imprisoned in the *Phlegm*, do display themselves, and exert their activity; for which reason it is that the Water becomes fragrant which was not so before.

The Extract doth contain almost all the Essential Salt of the Plant, wherefore it is of greater

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virtue than the Water; you must take care to Evaporate its moisture over a mild heat, for fear too much should be apt to carry off this Salt, which is but too Volatile of its own nature; for 'tis in the Salt that the principal virtue of the Plant doth consist.

C H A P. VIII.

Distillation of a Plant that is not Odoriferous, such as Carduus Benedictus, and its Essential Salt.

TAke a good quantity of *Carduus*, when it is in its prime; pound it in a Mortar, and fill with it two thirds of a Cucurbite; draw by expression a sufficient quantity of the Juyce of other *Carduus*, and pour it into the Cucurbit, that the Herbs swimming in the Juyce may incur no danger of sticking to the bottom during the Distillation: fit a Receiver to the Head, and Luting the junctures with a wet bladder, Distil with a fire of the second degree about half as much Water as you used Juyce, this Water is Sudorifick. It is used to drive out the Small-Pox, and in the Plague.

Express through a cloth that which remains in
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the Cucurbit, let the Juyce settle, and after it is filtred, Evaporate with a small fire about two Thirds of the moisture, in an earthen or glass Vessel: set this Vessel in a cool place, and leave it there eight or ten days, there will shoot out Crystals round about the Vessel, separate them, and keep them in a Viol well stoppt. These Crystals are called the *Essential Salt*; it is Sudorifick, the Dose is from six to sixteen grains in its proper distilled Water.

The *Extract* of *Carduus* may be likewise made the same way that I described for *Balm*.

Remarks.

Succory, *Fumitory*, *Sorrel*, *Scabious*, *Cresses*, and all other plants that are not Odoriferous, which have good store of Juyce, must be Distilled like the *Carduus Benedictus*, and this Method may serve to draw the Essential Salt out of any plant whatsoever.

Hot plants have much more of this Salt than others; the *Lettice* contains less than *Succory*, *Succory* less than *Sorrel*, and so of the rest.

Seeing it is in the Salt that the virtue of the plant consists, I would advise rather to use the Decoction of plants than their Distilled water, when the plants are in Season; and when they are out, then to have recourse to Distilled waters, and mix with 'em a little of their *Essential Salt*, or *Extract*.

The Fixt Alkali Salt may be drawn from the *Faces* of the Plant, in like manner as I have shewed to draw that of *Guaiaac*.

CH A P. I X.

Of Wine.

W*ine* is nothing else but the *Muste*, or Juyce of ripe Grapes, whose Spirituous parts are disingaged, and set at liberty in the Fermentation. This *Wine* is more or less gross, according as it abounds more or less with *Tartar*.

In the making of *White-Wine*, the *Muste* of White Grapes is left a Fermenting all alone; but *Claret* must Ferment with the *Faces* of the Grapes; whence it comes to pass that the Red is loaded with more *Tartar* than the White, and remains longer in the body after it is drunk. The Wines of hot Countries are commonly more Tartarous than others, by reason of the abundance of Salts which they attract from the earth. *Muscat*, and *Spanish Wine* do not endure a Fermentation, until good part of the phlegm is Evaporated, either by the heat of the Sun, or by fire; and this is the reason they become so glutinous as they do, almost like Syrup. Lastly, there may be made as many different *Wines*, as there

there can be different Fermentations to the *Muste*. Now let us consider what it is that happens in these Fermentations.

Muste is a sweet Liquor that sends no vapours into the head to Intoxicate, though one drinks never so much. If you distil it, there will rise first of all, good store of *Inspid water*, after that a fetid *Oil* with a few weak *Spirits*, which are nothing but an *Essential Salt* dissolved; and lastly there will remain a terrestrious Mass, out of which may be drawn some quantity of Fixt Salt by making a *Lixivium*, as we draw other Alkali Salts; but among all these substances we find none of those *Spirits* that make *Brandy*, and yet nevertheless when *Muste* hath Fermented for some time, it turns into Wine from whence you may draw a considerable quantity of Inflammable *Spirits*.

Now to explicate this effect you must know that *Muste* doth contain a great deal of *Essential Salt*; this Salt, like a Volatile, making an effort in the Fermentation to deliver it self from the Oily parts, with which it was before in a manner chained, pierces and divides them, until by its subtle and keen points it hath rarified them into Spirit. The *Spirit of Wine* then is nothing but an Oyl exalted by Salts, and these same Salts being a little disengaged from the cover they were wrapt up in, do change the wallowish sweetness of *Muste* into an agreeable Tartness, such as we perceive in our *French Wines*.

It is likewise remarkable that a sufficient quantity of Phlegm is requisite for the better separation

tion of the Salts in their Fermentation, and Exaltation of the Oyl ; for otherwise several changes are apt to happen : for example, when *Muscat*, and *Spanish Wine* are made, a great deal of Phlegm is separated from them ; for the *Muscat Grape* is left to dry in the Sun upon the Branches, before it is gathered to put into the Press, and some part of the Liquor of the *Muste*, with which *Spanish Wine* is made, is Evaporated before it is suffered to Ferment ; which is the cause that the Salts not having liberty to expatiate in, and rarifie the Oil as much as they would do if they had room, do make but an imperfect Fermentation. The Oyl being thus half exalted, hath still strength enough to hinder the Tartness of the Salt, and therefore only tickling the Nerves of the Tongue, makes us perceive in these Liquors a taste that is called sweet. And this is also the reason, why fewer Spirits are drawn from *Muscat* and *Spanish Wines*, than from *French Wines* ; for seeing the Spirit of Wine doth consist in a Rarified Oyl, there must needs be fewer Spirits in those than *French Wines*. But much more gross Oyl is drawn by Distillation from those half-fermented Wines.

If on the contrary the *Muste* should be loaded with too much Phlegm, as it happens often enough, there follows another imperfect Fermentation, because the Salts being too much weakned by it are not able sufficiently to cut and exalt the parts of Oyl, whence it comes to pass that these Wines are subject to grow *sluggish*. The Wines of *Languedoc* and *Provence* being extreamly

ly much loaded with *Tartar*, are grosser than the Wines of *Burgundy* and *Champaine*, because their Spirits are so impregnated with Salts and Earth. Wherefore the goodness of Wine may be said to proceed from a convenient proportion of *Phlegm* and *Tartar*.

Wine lessens the appetite, saith *Hippocrates*, and the cause may be said to be, because the Sulphurous Spirits it is charged with, do dull and weaken the Ferment of the Stomach, which by its irritation caused hunger.

Vinous Liquors may be made of all Fruits, and several other things, by means of Fermentation, as from Apples, Pears, Honey, and Hopps. In like manner Berries, Seeds, Leaves, and Flowers, may be made to Ferment: but because several of these things are naturally too dry to ferment easily, they must be moistned with Water, after they are beaten; and to quicken their Fermentation, a little *Yeast* is added, and by this means Liquors are made, whence Burning Spirits may be drawn, as well as from *Wine*.

Distillation of Wine into Brandy or Aqua-vita.

Fill with Wine half a large *Copper Vesica*, cover it with its *Moor's Head*, bordered with its *Refrigeratory*, and fit to it a *Receiver*; lute well the junctures with a wet Bladder, and distil with a gentle fire, about a quarter of the Liquor, or
else

else until the Liquor which distils doth not burn, when fire is put to it, that which is in the Receiver is called *Aqua-vita*.

Remarks.

Aqua-vita is a Spirit of Wine loaded with a phlegm, that it hath carried along with it in the Distillation; these Spirits do always rise first, and so 'tis known there remain no more in the Cucurbite, when the Liquor that Distills is no longer Inflammable.

Aqua-vita may be drawn from all sorts of Wines, but more of it is drawn in some Countries than others. For example, the Wines that are made about *Orleans* and *Paris* do yield more plenty of *Aqua-vita* than many others which seem to be stronger; and the reason is, that those Wines which appear stronger, being loaded with a great deal of *Tartar*, have their Spirits as it were fixed, whereas the others containing but a convenient portion of this *Tartar*, do leave their Spirits at greater liberty.

When we drink Wine, there's made a separation of Spirits in the body, very much resembling that which is made by Distillation: for the heat of the bowels warming it, causes the Spirituous parts to separate, which spreading on all sides through the Pores, some part of them mixes with the Bloud, and rarifies it, from whence it comes to rejoyce the heart, and encrease the strength of all the body; but because
these

these Spirits do always tend to be exalted, the greatest part rises up into the Brain, where it quickens its motion, and produces a certain gaiety that is capable of giving us many excellent thoughts.

But now if Wine moderately taken is so profitable for the Functions of the body, it likewise causes many mischievous consequences, when it is excessively used; for the Spirituous parts rising in great abundance do circulate in the Brain with so much celerity, that they soon confound the whole Oeconomy. And it is then that the objects do appear double, and the walls of the place where one is do seem to have changed their ordinary situation.

This Confusion remains until the Spirits having some good time attenuated, and dissolved the Phlegm, do part condense with it, and part spend through the pores.

It likewise happens then, that one's prone to sleep, because the *Pituita* being attenuated either by the Spirits of Wine, or by the Phlegm they have drawn along with 'em, glides into the small passages of the Brain, and retards the Circulation of the Animal Spirits, by gluing them with it; for after the same manner as the agitation of the Spirits in the Brain doth beget watchfulness, so their repose or condensation produces sleep. But I shall speak more amply of this subject hereafter, when I come to treat of the effects of *Opium*.

The sleep which is caused through excess of Wine doth usually remain until the Animal Spirits have

have rarified this Phlegmatick humour, and opened a free passage. Those who are intoxicated with Beer, Sider, or some such like Liquor, do remain in their Drunkenness a longer time, and sleep more after it, than those who are drunk with Wine, because the Spirit of these Liquors, carrying along with it a viscus Phlegm into the Brain, remains a longer time in disengaging it self, and passing through the Pores. Again it is the viscosity of this Phlegm, which entring into the *Sinus* of the Brain, makes so long a sleep, because it is hard to rarifie.

Those Accidents that I have related to proceed from the immoderate use of Wine, are but the first, and the less grievous, though indeed they are but little to be desired; every body knows that a continuation of frequent debauches doth at last render a Man dull and stupid, and this by reason the Spirits of Wine do not only trouble the Natural Spirits in their functions, and render them Phlegmatick, but likewise by rarifying of them do ever carry off some store along with them.

These Persons are likewise subject to frequent spitting, or else they are molested with Fluxions, Catarrhs, and Gout, because the *Pituita* being turn'd more liquid by the Spirits and Phlegm of vinous Liquors, is forced to descend through the Lymphatick Vessels; but if there happens the least obstacle in these Vessels, it takes its course along the Nerves, and falls upon all parts of the Body. Lastly, When excess of Wine occasions falling into the Apoplexy, and Palsie, it is by
reason

reason the *Pituita* is rendred too liquid by the Spirits and Phlegm of Wine, and causes Obstructions in the Head, and hinders the natural course of the Spirits into the Nerves. Many other sad consequences of Wine-debauches might be here mentioned, but this Digression is grown too long. Let us return to our Operation.

After the Wine hath been deprived of these Sulphurous Spirits, there remains in the Cucurbite a Tartarous Liquor, which being exposed a good while to the Sun in a Cask without its stopple, turns into good Vinegar. Some to hasten the mutation do add to it the eighth part of strong Vinegar, but I shall speak of Vinegar more at large hereafter.

It may be some such thing happens in the Bodies of those who accustom to drink too much Wine; for whereas the Volatile parts, which ascend into the Brain and Heart, by an agitation of the Spirits, do beget Joy; so on the contrary the Tartarous parts by fixing the humours about the *Hypochondria*, do cause by little and little that which is called Melancholy, which proceeds from an Acid; whence it comes to pass that many Men making a debauch upon Wine, with design to pass away their Melancholy, do afterwards find they have encreased it, when the debauch hath wrought its effect.

If you would by way of curiosity make an exact *Analysis* of Wine, you must take that which remains in the Cucurbite after the Distillation of *Aqua vita*, and distill off all the Phlegm, there will remain a Matter like unto Rosine, put it into

a Retort, and placing it in a Furnace, distill away more Phlegm, in a small Fire, until it begins to come sharp. Then fit a large Receiver to the Retort, and luting well the junctures, strengthen the fire by degrees, to drive out Acid Spirits, and a little fetid Oyl, continue the fire until there comes no more.

The Oyl is separated from the Spirit in a Funnel lined with brown paper; for the Spirit will pass through, and the Oyl being too thick will remain above. But it is here remarkable, that more of this Spirit and Oyl is drawn from Muste, than Wine; which sufficiently proves the Remark I made before, touching the origine of the Volatile Spirit of Wine; for seeing good store of the Oyl, and Essential Salt of Muste have contributed to make the Volatile Spirit of Wine, there must needs remain but very little Oyl, or Acid Spirit in the Liquor that *Aqua-vita* is drawn from; for the Acid Spirit is nothing but some Essential Salt dissolved in a little Phlegm.

The *Acid Spirit of Wine*, and the *Black Oil*, are like those of *Tartar*, which I shall describe anon. And an Alkali Salt wholly resembling that of *Tartar* may be drawn by a *Lixivium* from the Mass that remains in the Retort.

Spirit of Wine.

Fill a large Matraass with a long neck, half full with *Aqua-vita*, and fitting a Head and Receiver, lute close the junctures; set your Matraass upon a
Pot

pot half filled with Water, to distill in a vaporous Bath, the Spirit, which separates from its phlegm, and rises pure : continue this Degree of fire until nothing more does distill, thus you'll have a Dephlegmated Spirit of Wine in the very first Distillation.

It serves for a *Menstruum* to a great many things in Chymistry ; half a spoonful of it is given to Apoplectical, and Lethargical Persons, to make them come to themselves ; likewise their Wrists, Breast, and Face are rubbed with it. 'Tis a good Remedy for Burnings, if applied as soon as they happen ; and it is good for cold Pains, for the palsey, Contusions, and other Maladies, wherein it is requisite to discuss, and open the Pores.

Remarks.

The usual way of making *Spirit of Wine*, is by distilling *Aqua-vita* in a Limbeck so many times over until it comes pure ; and to do this, about half the *Aqua-vita* is drawn by Distillation, and the Phlegm that remains at bottom accounted of no use. Again, half the Spirit which was Distilled is anew drawn off, and the Phlegm thrown away ; these Rectifications are continued, until you find by firing a spoonful of the Spirit, every drop burns, and there remains not the least Phlegm ; but because this Operation is very tedious, and it is a hard matter to get a *Spirit of Wine* wholly free from Phlegm, even after nine or ten times repeating these Distillations, let the
fire

fire be never so small; Artists have invented a long Machine, which they call the *Serpent*, by reason of the circumvolutions which it makes. It is fitted to the Cucurbite containing the *Aqua-vita*, and the top made like a Funnel receives the Head, to which a Receiver is fitted, and the junctures well luted, and the vessel placed over a small fire, the *Spirits of Wine* do rise by this gentle heat, but the Phlegm being too heavy cannot ascend so high, so that thus a Spirit of Wine deprived of its Phlegm is had the very first time. But because this Machine is hard to carry into the Countrey, and other places where one would desire to make the Spirit of Wine, and besides it is subject to unsoulder in the junctures, through the violence of the Spirits; I conceived that the way I delivered for making *Spirit of Wine* was more commodious; for provided you have but a Matrafs and a Head, it will be an easie matter to draw as good *Spirit of Wine* as that of the *Serpent*, and there's no need to fear the Spirits breaking any way out of the vessel, if you do but lute well the junctures, as I have said.

The Matrafs must have a mighty long neck, that no Phlegm may be able to get up into the Receiver.

The vaporous Bath is fitter than any other to perform this Operation, because an extream moderate heat is requisite to raise up the Spirits all alone; now the vapour of Water warms very insensibly. You must continue the same Degree of fire, until there comes nothing more.

The *Spirit of Wine* is good for Lethargical, and Apoplecti-

Apoplectical Persons, because it puts the Spirits into a greater motion than they were in before. Now because according to all appearance these Diseases are caused by Obstructions which hinder the course of the Spirits into the Brain, this Spirit serves to give them a new vigour to dissolve and rarifie these Tartarous Viscosities which shut up their passage. It likewise discusses Tumours and Defluxions, because it not only opens the pores, and gives vent to the subtler part of the humour to perspire, but likewise dissolves and rarifies the grosser part, so as to render it fit to be carried away by the Motion of the Bloud.

The *Spirit of Wine* is excellent for Burnings, provided it be used as soon as they happen; for then it opens a passage for the igneous particles to come out at, and if there should remain any within the part, it unites with them as it uses to do when mixed with an Acid; for the Acid points incorporating with the *Spirit of Wine*, the Liquor loses much of its force; now the particles of fire may be compared unto Acid points.

Spirit of Wine Tartarised.

Put a Pound of *Salt of Tartar* into a long Glas-Cucurbite; pour upon it four Pounds of *Spirit of Wine* prepared as I said before: place your vessel in Sand, and cover it with a Head to which you fit a Receiver, lute well the junctures with a wet Bladder, and give under it

a gradual fire, which continue until three parts of the *Spirit of Wine* are risen; then remove the fire, and keep this Spirit in a Viol well stoppt; it hath the same virtues as the other, but is more subtile.

The moisture of what remains in the Cucurbite may be evaporated, and a *Salt of Tartar* got as good as it was before.

Remarks.

This Operation is only a Rectification of the *Spirit of Wine*, to render it more subtile than it was before; because the *Salt of Tartar* becomes impregnated with the Phlegmatick parts, and hinders them from rising.

The *Spirit of Wine* doth likewise volatilize, and carry along with it some portion of the *Salt of Tartar*, which gives it a mighty agreeable smell, and renders it a good Remedy for Obstructions. The Dose is half a spoonful.

Queen of Hungary's Water.

Fill a Glass or Earthen Cucurbite half full with *Rosemary Flowers*, gathered when they are at their best; pour upon it *Spirit of Wine* enough to infuse the *Flowers* in; set your Cucurbite in a *Balneum Mariae*, and joining its Head, and Receiver, lute close the junctures, and give under it a Digesting fire for three days time, after which
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unlute them, and pour into the Cucurbite that which may have been distilled. Refit your Alembick, and encrease the fire strong enough to distill the Liquor, so as one drop may immediately follow another; and when you shall have drawn about two thirds of it, and taken away the fire, let the vessels cool, and unlute them, you'll find in the Receiver a very good *Water of the Queen of Hungary*, keep it in a Viol well stoppt. It is good in the Palsie, Lethargy, Apoplexy, and Hysterical Maladies: The Dose is from one drachm to two. It is likewise used outwardly for Burnings, Tumours, Cold pains, Contusions, Palsie, and all other occasions, wherein it is requisite to revive the Spirits. Ladies use to mix half an ounce of it with six ounces of Lily-Water, or Bean-flower Water, and wash their Face with it, to clear their Skin.

Remarks.

The *Queen of Hungary's Water* is nothing but the *Spirit of Wine* impregnated with the Essence of *Rosemary* Flowers; you must distill it in a Fire that's strong enough, for otherwise the *Spirit of Wine* would rile all alone, or else draw along with it but very little Essence, as I have observed in working upon it.

The *Oyl* or *Essence of Rosemary*, may be made like the *Oyl of Cinnamon*, and some drops of it mixed in the *Spirit of Wine*, and hereby you have the *Queen of Hungary's Water* made upon the spot.

This Water works much the same effects as the *Spirit of Wine*, but more strongly.

CHAP. X.

Of Vinegar.

V*W*ines, like all other Liquors that use to Ferment, do grow sour by the dissolution of their Tartar in a second Fermentation: This dissolution is commonly made, when upon the Wines growing to decay, some of the more subtle Spirits are dissipated and lost; for the Tartar taking their place fixes the rest of the Spirits which remain in the Wine, so that they can act no longer: This fixation is the cause that when the Wine turns sour, very little quantity of it is diminished, and very little Tartar is found in the Vessels wherein *Vinegar* is made.

To the end Wine may quickly sour, you must set the Vessel that contains it in some hot place, and mix the Lees from time to time; for this Tartar will easily dissolve, when heat comes to act upon it.

Distilla

Distillation of Vinegar.

Put six quarts of strong *Vinegar* into an earthen pan; evaporate in *Balneum Maria* about a quart, which is the Phlegmatick part; and pour that which remains into a glass or earthen Cucurbite, and distil it in a good strong sand-heat, until there remains at bottom nothing but a substance like Honey; keep this *Vinegar* well stoppt, many do call it *Spirit of Vinegar*.

Its principal use is to dissolve or precipitate bodies. It is sometimes mixed in Cardiacal Portions, to resist putrefaction; the Dose is half a spoonful: it is mixed with water, and this Oxy-crate is used to stop Hemorrhagies, taken inwardly, and to assuage Inflammations, applied outwardly.

Remarks.

The *Acid of Vinegar* consists in an *Essential*, or *Tartarous Salt*, which being heavier than the *Phlegm* rises last; but you must evaporate this *Phlegm* very gently, because the *Acid of Vinegar* doth easily sublime along with it.

I do use an earthen Pan, rather than a Cucurbite, that the *Phlegm of Vinegar* finding a large open passage may evaporate the more easily.

Common Vinegar keeps its strength a longer time than the *Distilled*, because it contains a more

Terrestrious Salt, that doth not Volatilize so easily. And for this reason, one should rather choose to use *Vinegar* newly Distilled, than that which hath been a good while kept. All Acids are Cardiacal, and good against a malignity of humors, when it is caused by too great an agitation, because it fixes and Coagulates them, moderating their motion. Thus in places where the Air is corrupted, and grown Pestilential, *Vinegar* is a good Preservative; you must every morning take half a Spoonful of it Fasting; but in Diseases which proceed from a Tartarous humour, as the Hypochondriack Melancholy, it is rather hurtful than good, because it fixes the humors more.

CHAP. XI.

Of Tartar.

ANy gross or terrestrious Matter, that sticks to the sides of the vessel, when separated from its Liquor by means of Fermentation, is called *Tartar*. But the *Tartar* I am going to speak of here, is that of *Wine*. It is found sticking to Casks like a very hard-stone, sometimes White, and sometimes Red, according to the colour of the Wine it comes from.

White

White *Tartar* is to be prefer'd before Red, because it is purer, and contains less earth; both one and t'other are had in greater abundance in hot Countries, such as *Languedock* and *Provence*, then many other Climats; but the best White *Tartar* of all is brought out of *Germany*, it must be weighty, White, and Crystalline.

The *Lees* of *Wine* are likewise a *Liquified Tartar*, they are burned, and the Ashes that are made of them are called *Cineres Clavellati*, in English, *Gravelled Ashes*.

Crystal of Tartar.

Boil in a great deal of Water what quantity of *White Tartar* you please, until it is all dissolved; pass the Liquor warm through *Hippocrates his Sleeve*, in an earthen Vessel, and evaporate over the fire about half the moisture: set the Vessel in a cool place two or three days, and you'll find little *Crystals* on the sides, which separate; evaporate again half the Liquor that remains and remit the Vessel to the Cellar as before, there will shoot out new *Crystals*; continue doing thus, until you have gotten all your *Tartar*, dry the *Crystals* in the Sun, and keep them for use.

The *Crystal of Tartar* is Purgative, and Aperitive; it is good for Hydropical, and Asthmatical persons, and for Tertian, and Quartan Agues.

Remarks.

This Operation is, to speak properly, nothing but a Purification of the more Terrestrious parts of *Tartar*. You must observe to boil it in an earthen vessel, rather than any Metallick one, because it would be apt to draw some Tincture from it.

A *Skin* that swims a-top after evaporation of some part of the Liquor was heretofore carefully taken off, and there was thought to be some difference between it, and the Crystal of Tartar. But this *Cream* or *Skin* is only a part of the *Tartar* that begins to Coagulate, and so it is the very same thing with the *Crystal*.

Soluble Emetick Tartar.

Put into a glass vessel four ounces of *Crystal of Tartar* powdered; pour upon it *Spirit of Urine*, until it rises two fingers above the Marter, there will happen a small ebullition, because the *Cream of Tartar* will dissolve in the *Spirit of Urine*; when the dissolution is finished, add to it an ounce of the *Glass of Antimony* finely powdered, and eight or ten ounces of Water; boil it all in a Sand fire seven or eight hours, and take care to put more hot water into the vessel, as the liquor consumes; after that filtrate, and evaporate gently in Sand all the moisture, and there

there will remain a greyish powder drawing towards White, keep it in a Viol well stoppt. It is an Emetick that works with little violence; the Dose is from four to fifteen grains in Broth.

Remarks.

The Ebullition which happens in this Operation, proceeds from the *Cream of Tartars* meeting with the Volatile and Alkali Salt of *Urine*; for the Acid of *Tartar* piercing the Salt of *Urine* divides its parts, and gives vent to igneous bodies which were there imprisoned, and now finding themselves free break out in great haste.

Some part of the *Glass* of *Antimony* dissolves in the boiling, and gives the Emetick quality to the powder. It is a very gentle Vomit, because the *Tartar* fixes, and stops a little the Sulphurs of *Antimony*.

Distillation of Tartar.

Fill two thirds of a Retort with *Tartar* grossly powdered, place your Retort in a Reverberatory Furnace, and fitting to it a large capacious Receiver, begin the Distillation with a very small fire for three hours only to warm the Retort, and drive out the Phlegm drop by drop; throw away this Insipid water, and refitting the Receiver Lute close the junctures, encrease the fire

fire by little and little, and you'll see Spirits fill the Receiver with Clouds; continue it that the Oyl may likewise come forth; then when there will come no more, let the Vessels cool, and unlute them; pour that which is in the Recipient into a Funnel lined with brown paper, that the Spirit may filtrate, and separate from the thick, black Oyl that remains in the filter: keep this Oyl in a Viol, it is good to give to smell to in Hysterical vapours: it would be good to rub Paralytical parts with, and for cold pains, but by reason of its nasty smell, it is not used.

Pour the Spirit into a Glass Cucurbite, and rectifie it by Distilling it in Sand, it is good against the Palsie, *Asthma*, and Scurvy, it works by Urine, and Sweat. It is used in Hysterical Maladies, and for the Epilepsie; the Dose is from one drachm to three in some appropriate Liquor.

You'll find in the Retort a black Mass, from which a Salt may be drawn, as I shall shew hereafter.

Remarks.

Almost all Authors who have spoke of *Tartar* have asserted, that two sorts of Spirits could be drawn from it by Distillation, the one very Volatile, the other fixt and Acid; wherefore after all had mixed confusedly in the Receiver, they separated the Oyl, and added some Alkali, such as Coral, or Crabs-eyes, on that which remained, then

then they turn'd it into a Cucurbite, and distilled about half the Liquor, which they pretended to be a Volatile Spirit; for the Acid Spirit remain'd absorb'd by the Alkali, with the Phlegm in the bottom of the Cucurbite.

But having vowed never to be led by any Authority which is not founded upon Experience, I have examined the nature of *Tartar* as strictly as was possible for me, and after a great many distillations of it, I could never perceive this Volatile Spirit, which hath been intruded upon us; all that I could ever find is this, that *Tartar* contains good store of Essential Salt, which renders it Acid, and that this Salt coming forth by Distillation, and being mixed with Phlegm, doth make all the Spirit that can be drawn from *Tartar*. So that the *Spirit of Tartar* according to the description of these men is only the more Phlegmatick part of the Liquor, that is to say, the most deprived of this Essential Salt, because almost all of it doth adhere unto the Alkali body of Coral, or Crabs-eyes, that were added to it. But according to the way I have set down, the Spirit may be drawn as pure as may be, because I do not leave it to mix with the Phlegm, which comes out first.

If we Rectifie the Spirit, it is done to purifie it from some Terrestrious parts, which might have past along with it in the Distillation.

*Fixt Salt of Tartar, and its Liquor, called
Oyl per Deliquium.*

Break the Retort which served you for Distillation of *Tartar*, and take the Black Mass you find there; Calcine it until it becomes white, then put it into a great deal of warm Water, and make a *Lixivium*, filtrate it, and pour it into a Glass, or Earthen Vessel, evaporate in a Sand-heat all the moisture, and there will remain a white Salt, which is called the *Alkali Salt of Tartar*.

This Salt is Aperitive, it is used to draw out the Tincture of Vegetables, and is given for Obstructions; the Dose is from ten to thirty drops in Broth, or Laxative Infusions.

If you expose for some days in a Cellar this *Salt of Tartar* in a wide Glass vessel, it will dissolve into a Liquor that is improperly called *Oyl of Tartar per Deliquium*.

It is used for Tettars, and to discuss Tumours; the Ladies use to mix it in Lily-water to clear their complexion, and hands.

Remarks.

In these two last Operations I have given you the means of obtaining all that can be got from *Tartar*; but those who have no need of the Spirit or Oyl, and would only desire the *Salt*, may powder

powder Crude *Tartar*, and wrapping it up in Paper may Calcine it until it turns into a white Mass; after which they will draw the Salt by a *Lixivium*, as I said before.

Alkali Salts are Aperitive, in that they dissolve the slimy humours which are the cause of Obstructions.

The Liquor or Oyl made *per Deliquium* is only a *Salt of Tartar* dissolved by the moisture of the Cellar. If you would make it quickly, you must dissolve the *Salt of Tartar* in as much Rain Water well filtred, as is needful to turn it into Liquor. It may be used like the former, it cures Tettars, and discusses Tumours, because being an Alkaly it sweetens the keen Salts which fomented these Maladies.

Tincture of the Salt of Tartar.

Melt in a good Crucible a pound of *Salt of Tartar* in a great fire, and when it is in *Fusion*, cover it with a Tile, and put Coals all round it; blow about it so, as to raise a stronger heat than if you were melting of Gold; continue this Degree of fire about eight Hours, or until your *Salt of Tartar* is of a red Marble colour, which you may know by thrusting the end of a *Spatula* into the Crucible, for when it is drawn out, you'll find a little Matter stuck to it; then take out the Crucible with a pair of Tongs, and turn it upside down into a warm Mortar, the Matter will coagulate in a little time, powder it presently,
and

and put it into a Matrafs warmed before-hand ; pour upon it the *Spirit of Wine Tartarized*, until it swims four fingers above the matter : stop the Matrafs with another to make a Double-vessel, lute the junctures close with a wet Bladder, set your Matrafs in Sand, and heat it with a gradual fire, to make the *Spirit of Wine* boil seven or eight hours, during which time it will assume a red colour. After that let the Vessels cool, and unlute them ; separate by Inclination this most fragrant *Tincture*, and keep it in a Viol well stopd.

One may pour more *Spirit of Wine* on the remaining *Salt of Tartar*, and proceed as before, as long as it will draw out any *Tincture*.

The *Tincture* of the *Salt of Tartar* is an excellent Aperitive, it purifies the blood, and resists the malignity of humours. It is used in the Scurvy, the Dose is from ten to thirty drops in some convenient Liquor.

Remarks.

You must place the Crucible in the Reverberatory upon a Tile, for fear lest the Wind which comes through the Doors of the Ash hole, and Fire-room, might be apt to cool the bottom, and hinder its *Fusion*.

Many have writ that it is sufficient to Calcine the *Salt of Tartar* two Hours in a violent fire, or until the *Salt of Tartar* turns blewish ; but after having tried several times to make the *Tincture*

cture according to this description, I could never be able to attain it; it is true the *Spirit of Wine* will be a little Tinctured, but it comes not near that which is necessary to call it the true *Tincture of the Salt of Tartar*; for it should be red like Wine, and to make it so, it is requisite to Calcine it as I have said, and good store of it should be put into the Crucible, because it diminishes exceedingly. You must likewise take care to use the *Spirit of Wine well Rectified*, for if there should be any Phlegm at all, it would not turn red.

This *Tincture* doth not proceed from Fixt Sulphur contained in the *Salt of Tartar*, as many have pretended; it is only an *Exaltation* of this *Salt* in the *Spirit of Wine*; for if by way of Curiosity you would distill this *Tincture*, you would be able to recover only a *Spirit of Wine*, and yet nevertheless there will remain at bottom only a small quantity of *Salt of Tartar* with its usual whiteness; which shews sufficiently that this colour did only proceed from the exact mixture of the *Spirit of Wine* with the *Salt of Tartar*, seeing upon their division the colour disappears.

Magistery of Tartar, or Tartar Vitriolated.

Put into a Glass Body what quantity you please of *Oyl of Tartar made per Deliquium*, pour upon it by little and little *Rectified Spirit of Vitriol*, there will rise a great effervescency: continue to drop more in, till there's no further

further Ebullition; then place your Cucurbite in Sand, and evaporate all the moisture in a little fire, there will remain a very white Salt, keep it in a Viol well stopt.

Remarks.

Tartar Vitriolated may be made with *Salt of Tartar* as well as with the *Oyl*; the Ebullition proceeds from that the Acid of *Vitriol* piercing the *Alkali Salt of Tartar*, doth violently separate its parts, and gives vent to the igneous Bodies which were there imprisoned; and this Effervescency comes to pass as often as an *Alkali* meets with an Acid, and remains until the Acid can find no more to penetrate in the *Salt of Tartar*. Then there follows a kind of *Coagulum* at the bottom of the Vessel, because the Acid and *Alkali* clasping together, do lose their motion, and by their own weight precipitate to the bottom. And this causes the Liquor to be less acrimonious than the *Oyl of Tartar* was before, though at least an equal quantity of the *Spirit of Vitriol* was there mixed. You must evaporate the moisture gently, and that especially toward the end, for fear the Acid should rise with all.

This *Salt* is whiter than common *Salt of Tartar*, as having been subtilized by Acids, after the same manner as we see several other white things encrease in their colour, as they are beaten small into a powder.

Acids

Acids do sometimes dissolve and rarifie, and at other times coagulate and precipitate, as may be seen by the Operations which have been described. These several actions do seem very strange, for it is hard to conceive how one and the same Liquor should be able to produce contrary effects; But I'll venture to give you an explication of this *Phanomenon*, which because it is built upon experience, may perhaps meet with some Approbation.

An Acid proves always a dissolvent, when good store of it is poured upon the Matter that is to be dissolved; but it makes a *Coagulum* as constantly, when falling in a small quantity, its points are fixed in the pores of the Matter, and have not power enough to divide it and get out; and this is seen plainly, when the *Spirit of Vitriol* is poured upon the Liquor of *Salt of Tartar*; for if you should mix but as much as is requisite to penetrate the Salt, the Acid points do remain sheathed in it, and load it down, whence a Coagulation and Precipitation happens; but if now so much more, or a greater quantity of *Spirit of Vitriol*, should be still added to the Liquor, the *Coagulum* will disappear, by reason that the little Bodies which being gathered together maintained their part against the Acid, and hindred its motion, will be then scattered and dissolved by the Acid, that is now grown the stronger.

The same thing may be remarked in all other Bodies which can be dissolved by Acids; for if you take a little of any of those, and pour a little Acid upon it, there rises a great effervescency,

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and after that a *Coagulum*, but if you augment the Acid, the Matter will all dissolve.

An Acid can likewise Precipitate what an Alkali hath dissolved, as wee see in the Operation of the Magistery of Sulphur, and this because the Acid having dissolved and separated the parts of the Alkali makes it let go its hold, and the body precipitates by its own weight.

When Milk coagulates by the means of an Acid, it is because it contains a great deal of Cheese, into which the Acid enters, and losing its motion weighs it down; whence it comes to pass that the *Coagulum* which is made with a weak Acid, precipitates much less than that which is made with a greater quantity of Acid; but if you should by way of curiosity pour a great deal of Acid into the Precipitated *Coagulum*, you would find it all dissolve away at last.

If Dough ferments and swells, when Leaven is added to it, 'tis because this Leaven being full of Acids doth divide and rarifie the parts of the Meal, and makes them occupy more place than they did before; but because these Acids are but few, they have not strength enough to divide the Matter as much as it was capable of, and are forced to lose their motion in the Dough, after having spent all their throws and force.

The Coagulation then which Acids do cause may justly be said to be an imperfect dissolution of Bodies, and I could here relate a great many other Examples to prove what I have asserted. But I shall content my self with those that have been used. And now let us see whether this Dis-
course

course may be able to furnish us with any thing that illustrates the Digestion of Aliments in the Stomach.

Most of our Modern Philosophers have not spared the notion of Acid, when they have endeavoured to explicate Digestion, they have conceived the Membranes of the Stomach to be all impregnated with it, and many of them not contented with this Liquor alone have sought for some more of it from the Spleen and *Pancreas*: but if all these Acids were really in the Stomach, the Aliments would not scape coagulating, and consequently an Indigestion, as uses to happen, after taking too many Acids at Meals; for conceive never so great a quantity of it, either there would not be enough to dissolve the Aliments, or else the Membranes of the Stomach would be attenuated and concocted too, as well as that which they contain, which nevertheless doth not happen in the natural temper of the Body.

There's no need of seeking these Imaginary Acids to cause Digestion; the spittle which mixes among the Aliments as they receive their first Trituration between the Teeth, will furnish us with enough to actuate the Fermentation in the Stomach; there is but a little Acid requisite to set the parts in motion, and when once they are moved, they do contain enough Salts and Spirits, which being quickned by the heat of this Part, will break all their Chains, and find a vent out, whence infallibly follows an attenuation of the Aliment into a Chylous substance.

It will be said, without doubt, that this irrita-

tion in the Stomach, which is called *Hunger*, cannot be produced by any thing but an Acid, which finding no more Aliments to work upon, acts upon the Membranes themselves. But I think I explicate this Irritation better, according to my Opinion, than that of these Men; for I may with reason enough say, that the spittle finding the Stomach deprived of Aliments, ferments alone, and creates this Irritation, seeing that spittle, as every body must grant, is loaded with Salt; but as for them, they must make an Acid come from the Membranes, which nevertheless doth not irritate them, but only when it meets with nothing else in the Stomach to exercise upon, which is a thing hard enough to comprehend.

I know very well that some of them to avoid this difficulty will say, that the Acid is generated in the Stomach from the remainder of that which is eaten, which continuing some time in the Stomach produces a Leaven after the same manner as Dough; but then they must explicate to me what the Ferment consisted of, which served to digest the first Aliments that the Infant took.

C H A P. XII.

Of Opium.

O *Pium* is a Tear, or Líquor which distills of it self, by Incision of *Poppy-heads* that are found very frequently in *Greece* in the Kingdom of *Cambaia*, and the territories of *Grand-Cairo* in *Egypt* : there are three sorts of it, the Black, White, and Yellow.

The Inhabitants of those Countries do keep this *Opium* for their own use, and do send us only the *Meconium*, which is nothing else but the *Juyce* of these same *Poppy-heads*, drawn by expression thickned, and wrapt up in leaves to facilitate their carriage. It is this Drug that we improperly call *Opium*, and always use for want of the true; but being more impure than the true, it hath not so much activity, and strength.

A *Meconium* may be made after the same manner with the Heads of *Poppies* that grow in *Italy*, *Languedoc*, and *Provence*, but it will prove much weaker than the former.

The *Opium* which comes from *Thebes*, or *Grand-Cairo*, is accounted the best of all, you must choose it Black, Inflammable, bitter to the taste, and a little Acid, its smell must be disagreeable and stupefactive.

Extract of Opium, called Laudanum.

Cut in slices four ounces of good *Opium*, and put it into a Matrafs; pour upon it a quart of Rain-water well filtered; stop your Matrafs, and setting it in Sand, give your fire to make the Liquor boil for two hours, strain it warm, and pour it into a bottle.

Take the *Opium* which remains undissolved in Rain-water; dry it in an earthen Pan, over a small fire, and putting it into a Matrafs pour upon it *Spirit of Wine* to the height of four fingers; stop the Matrafs, and digest the Matter twelve hours in hot Ashes; afterwards strain the Liquor, and there will remain a glutinous earth that is to be flung away.

Evaporate both these dissolutions of *Opium* separately, in earthen or glass vessels, in a Sand-heat, to the consistence of Honey, then mix them, and make an end of drying this mixture with a very gentle heat, to give it the consistence of Pills, or a solid Extract.

It is the most certain Soporifick that we have in Physick, the Dose is from half a grain to three, in some convenient Conserve, or else dissolved in a Julep.

Remarks

Remarks.

Opium is compounded of a Spirituous part, and a gross terrestrious Rosine; the Spirituous part may be easily dissolved in water, but the Rosinous requires a more convenient *Menstruum*, such as *Spirit of Wine*. You must dry the *Opium* after the first dissolution, least the *Spirit of Wine* might be too much weakned by the watry parts that remain, which would hinder the dissolution from being done so well as it should be.

Distilled Vinegar dissolves *Opium*, but the Acids may be said to diminish its vertue, by destroying or fixing its Volatile part, which serves for a vehicle to the other.

Spirit of Wine all alone might be used to dissolve both parts of *Opium*, but it were to be feared it would carry away with it the Volatile part in the Evaporation.

All that is in the *Opium* is preserved by my description; for the Rosinous part dissolved in the *Spirit of Wine* cannot evaporate with it, because it is heavier; and the other part which I call Volatile in comparison with the first is mixt with a little Rosine that keeps it back, while the moisture evaporates. The truth of this I have experimented, and any body else may try as well as I have done, by Distilling these Liquors. Lastly it is hard to observe any greater precaution for the preservation of all the pure parts of *Opium*,

and fewer *Menstruums* can be used that are more convenient.

Almost all Authors have appointed to torrifie *Opium* before it be dissolved, to the end a certain malignity which they say is in it may be evaporated; but that which they call malignity is nothing but these same Spirits, or Sulphurs, that are most Volatile, whereof I spoke but now; so that by the Torrefaction they deprive it of its more active part. They further add to the Extract commonly drawn with the *Spirit of Wine*, Corals, Pearles, Treacle, Extract of Saffron, Cordial Confections, Hystericks, and other things which may be able to resist a cold malignity in the fourth degree that they pretend to be in *Opium*. But experience convinces us that it is not in the least dangerous, when given in the foresaid Dose, so that there is no need at all of carrying away its Volatile parts by Torrefaction, nor of mixing it with other ingredients which may hinder its operation, or retard its effect. It belongs to the Physician, when he thinks fit to give it, to judge whether there's any need of an Hysterick or Cordial Drug, with which he may appoint it to be mixed upon the spot.

I shall not stay to examine here whether *Opium* is cold or hot; they who have made the Anatomy of this Mixt, do know very well that it is almost all of it Sulphur. I shall endeavour only to explicate its effects the most sensibly it is possible for me according to the Rules of Chymistry.

The virtue of *Opium* consists in causing sleep, and this by calming the motion of the Spirits;
for

for since that watchfulness proceeds from the agitation of the Spirits, which by rarifying the humors in the little passages of the Brain do augment their Circulation, it may surely be said with a great deal of probability that sleep is caused by some condensation of the same humors, which happens from a repose of the Spirits in the Brain. According to this Principle then there must be contained in *Opium*, and all other Soporifics, a certain substance that inviscates the Spirits, and hinders them for some time from Circulating so fast as they did before. Let us examine now, whether any such thing can probably be found in *Opium*, by the *Analysis* I have made of it: first of all I have observed a Spirituous part, but after that hath been drawn out by means of Rain-water, there remains a gummous and terrestrious Matter, and this is the substance that I find exceeding proper to produce this effect. For nothing in Physick is so fit to thicken the bloud, and other humors, as things that are Mucilaginous: Milk, and the Emulsions which are drawn from divers seeds, the Water-Lily, Lettice, nay and all temperate Aliments, do frequently incline to sleep, because they are impregnated with a gummous substance, which mixing in the bloud serves to agglutinate the Spirits, and moderate the quickness of their motion; this now being supposed, it is an easie matter to conceive how *Opium* makes one sleep, seeing it is loaded with Mucilaginous parts, which may be conveighed into the Vessels.

But without doubt it will be here objected,
that

that *Opium* is full of subtile parts, which on the contrary instead of condensing the Spirits must needs rarifie them; and further, that according to my discourse all sorts of Gummous Matters should incline to sleep as well as *Opium*, which is a thing manifestly false.

In the first place, I answer, that the Spirits of *Opium* being moved by the heat of the Stomach do serve to elevate the Gummous part, and conduct it into the little passages of the Brain, but having there introduced them, they either fly away through their Volatile nature, or else condense with the moisture of the Brain. The same thing happens, after drinking any Spirituous Liquor, such as Wine, Cyder, or Beer; for the Sulphurous Spirits of these Liquors conveighing along with 'em some Phlegmatick parts, do insinuate them into the little vessels of the Brain, or else do cause some Coagulation there, whence it comes to pass that a man who is drunk commonly sleeps until the Spirits of the Liquor he is intoxicated with, are in part evaporated out of his Brain.

In the second place, I say that all Gummous or Viscous things are not able to cause a sleepiness as *Opium* does, because they have not equally the same proportion of Volatile Spirits to convey them into the Brain. They may indeed, by giving more consistence to the Bloud, moderate its motion a little, and give some disposition toward sleeping; but it will not be done so quickly as by means of *Opium*, and they likewise do it with a great deal less force.

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The viscous parts of *Opium* insinuating into the small Channels of the Brain, do there produce a condensation or thickning of the humors, until by little and little new Spirits do draw together, which by dissolving and rarifying this glue, do carry it along with the Bloud, or other Humors. And then it is that the Dozing ceases, and one finds ones self awake as before.

Reason may be given why Pains in many places are asswaged after the effect of *Laudanum*, for these Pains being caused by an Agitation of the Spirits, when these Spirits are condensed, the Pain consequently ceases. And this *Opium* does perform exceeding well, as I have said.

Those who fall into *Deliriums* in a continued Feaver, do find themselves extremely comforted by the use of *Opium*, by reason that the principal cause of this accident is a sharp Salt, which slides into the passages of the Brain, and irritates the Membranes. Now *Laudanum* which is a viscous substance, unites with these Salts by means of its Sulphur, and takes away their Acrimony. It likewise stops the Dysentery, the Flux of the Terms, and other Hemorrhagies by sweetning the sharp Salts which fomented them.

Lastly *Opium* may be said to be one of the greatest Remedies that we have, when it is properly administred, and in a reasonable Dose: but when it is given in too great a quantity, it so thickens and glues together the humors in the Brain by its viscous parts, that the Spirits which come afterwards, not being able to dissolve this viscosity, are forced to stop and congeal by little
and

and little, until at last they lose all their motion, whence it comes to pass that many dye away after taking of *Opium*.

It is remarkable, that many do so accustom themselves to the use of *Opium*, that at last it is not able scarce to make them sleep, except when they take three or four times as much as is commonly given. There are some in *France*, who can venture to take up to a drachm, and this quantity does no more in them than two grains in another.

It is well known that the *Turks* will take the bigness of a hazle Nut, to fortifie themselves when they are going to fight. The reason that they can do so is, that *Opium* passing a great many times into the small vessels of the Brain, hath in great measure dilated them. So that finding the passage very large, it makes little or no stop, unless taken in a greater quantity than before; for the *Turks* do not only accustom themselves to the taking of *Opium* by little and little, but being of a hotter Temperament than we, they supply more Spirits to the Brain for rarefaction of the humors, which *Opium* might there have condensed.

If the *Turks* do find themselves fortified as soon as they have taken *Opium*, it is by reason of these Volatile Spirits, which work in them much the same effect, as the Spirits of Wine use to do in respect of us.

C H A P. XIII.

Of *Aloes*.

A *Loes* is the thickned Juyce of a Plant bearing the same name, it grows in many Countries, especially in *Egypt*, whence it is brought to us; the best is that which is called *Hepatick*, and *Succotrine*, because it is of the colour of the Liver, and a great deal of it is had from an Island of *Persia*, called *Socotra*; the *Hepatick* is drawn by Incisions made on the Plant, it is friable, of an offensive smell, and very bitter taste.

There's another sort of *Aloes*, which doth not differ from the former, but only in that being drawn by Expression, many Impurities are mixed with it, it is compact, heavy, and smells not so strong as the other. 'Tis called *Aloes Caballina*, because Farriers do use it for their Horses.

Extract of *Aloes*.

Dissolve eight ounces of *Aloes Succotrina* in a sufficient quantity of Juyce of *Roses*, or a strong Decoction of *Violet Flowers*; let the dissolution settle five or six hours, then separate it by Inclination, and when you have filtered it, evaporate

rate the moisture gently, until the matter remains in the consistence of an *Extract*, keep it in a Pot.

'Tis a good Remedy to purge the Stomach, fortifying it withall, the Dose is from fifteen grains to a drachm in Pills; it is likewise good to make the Terms come.

Remarks.

This Preparation is nothing but a Purification of *Aloes* into an Hepatick Liquor. Pills are made of this *Extract*, and are called *Pills of Frankfort*, some do add to them Mastich, Rhubarb, and other Stomachick Ingredients; it is the Basis of the *Angelical Pills*.

Aloetick Pills may be taken at Meat, they seldom purge till the next Day. They bring the Hemorrhoids, and Terms, in that *Aloes* rarifies the Bloud by its Fermentative Salt, and drives it out of the veins with impetuosity.

C H A P. XIV.

Of Tabaco.

T*Abaco* is a Plant with broad Leaves, that grows abundantly in many places of *America*, as *Bazile*, and *Pern*, but the best of all that comes to us is from *Florida*. It hath been transplanted among us, but the Countrey not being hot enough, that which grows here, is not so strong as the *Tabaco* that is brought out of *America*.

Tabaco, either chewed or smoked ever now and then, makes a great discharge of humours from the Head; but if it is used too immoderately it is apt to cause several Diseases, such as the Palsie, and Apoplexy. It is beaten, and applied on tumours to discuss them, it being loaded with Spirits which rarifie and open the Pores. It is likewise infused in common Water, and Tetters and other itchings of the Skin are washed with this Infusion, but you must have a care that the Water be not too much charged with it, for fear of giving a vomit.

Tabaco kills Serpents, Vipers, Lizards, and such like Animals, if you open a hole in their flesh, and thrust a little bit into it.

Distilla-

Distillation of Tabaco.

Put into a Glass-Cucurbite eight ounces of good *Tabaco* cut small; pour upon it about an equal weight of *Phlegm of Vitriol*, cover the Cucurbite with its Head, and digest the matter in Sand for a Day, fit to it a Receiver, and Distill about five ounces of Liquor in a small fire, keep it in a viol.

It is a powerful vomitive, the Dose is from two drachms to six in some appropriate Liquor, it is likewise good for Tettars, and the Itch, being rubbed lightly with it.

Put that which remains in the Cucurbite into an Earthen Retort, or Glass one luted, place it in a Furnace, and fit to it a great Receiver, and luting close the junctures, begin with a small fire to expell all the Phlegm; augment it by little and little, and the Spirits will come forth confusedly with a black Oyl; continue the fire until there comes no more, then let the Vessels cool, and unlute them; pour that which you find in the Receiver into a Funnel lined with Brown-Paper, the Watry part will pass through, while the black and fetid Oyl remains in the Filter, keep it in a Viol: a drachm of it may be mixed with two ounces of Hogs-Grease, 'tis a good Remedy for the Itch and Tettars.

An Alkali Salt may be drawn out of the Coals that remain in the Retort, after the same manner as the Salt of *Guaiacum*. This Salt is Sudorifick,
the

the Dose is from four grains to ten in some convenient Liquor.

Remarks.

Tabaco is full of such piercing Sulphurs and Volatile Salts, that as soon as ever it is in the Stomach, it falls a pricking the Fibers, and moving to vomit.

The *Oyl of Tabaco* is so great a Vomitive, that if one should but hold ones Nose a little over the Viol, in which it is kept, 'twould make one vomit.

One Day I made a small Incision in the Skin of a Dog's thigh, and thrusting in a little Tent dipt in the *Oyl of Tabaco*, the Dog immediately purged both upwards and downwards with a great deal of violence.

The *Fixt Salt* of *Tabaco* may be made as I have said, but if you would have any quantity of it, you must joyn a great deal of other *Tabaco* with it, for receiving so little matter out of the Retort, 'twould be hard to get a drachm of Salt.

C H A P. XV.

Extractum Panchymagogum.

TAKE an ounce and a half of the *Pulp* of *Coloquintida*, one ounce of the *Powder* of *Diarrhodon Abbatis*, so much good *Agarick*, and two ounces of *Black Hellebore*, powder it all grossly, and put it into a *Matrass*: pour upon it *Spirit of Wine* four fingers higher than the mixture. Stop the *Matrass* close, and set it in *Digestion* in warm *Sand*, or in *Horse-dung*, and shake the *Vessel* ever now and then.

Beat small an ounce of good friable *Scammony*, put it into a *Viol*, and pour *Spirit of Wine* four fingers above it; stop well the *Viol*, and leave it in *Digestion*, like the other. After that time separate the *Impregnations* by *Inclination*, and mix them.

Put the *Feces* of both into the same *Matrass*, and pour upon it more *Spirit of Wine*; stop it well, and leave it in *Digestion* as before, to draw out the rest of the *Tincture*; separate it again by *Inclination*, and then mixing the *Liquors*, filtrate them, and pour them into a *Cucurbite*: Distill some part of it in a *Vaporous Bath*, until the remainder be reduced to the consistence of *Syrup*; then take off the *Head*, and keep this *Spirit of Wine*, which may serve you another time for the same

same Operation. Put that which is contained in the Cucurbite into an Earthen Cup, and add two ounces of the *Extract of Aloes* prepared as before. Dissolve and dry it all in a very gentle fire, to the consistence of an *Extract*.

It purges all the humours well, the Dose is from one scruple to two in Pills.

Remarks.

The Flesh or pulp of *Coloquintida* is nothing but the Apple it self cleansed from its Seeds. It purges the Brain, the best is that which is whitest and lightest.

The powder *Diarrhodon Abbatis* is Cordial, and resists the malignity of humours, it takes its name from the *Rose*, which is its *Basis*.

The *Agarick* is a Rosinous Mushroom, that grows on the *Larix*, the best is the whiter, lighter, and most friable; it is used to purge the Brain.

The Root of *Black Hellebore* is a mighty strong purger of Melancholy, wherefore it is given to Hypochondriacal persons, and even to the Maniacal; it provokes vomit, when taken alone, but with this mixture it fixes downwards; the white is poison, taken inwardly, it is never used but for sneezing.

Scammony is a very Purgative Gummous Juice, the best is most friable, which being powdered hath a grey colour drawing toward White.

Aloes is said to purge *Choler*, I have spoken of its virtues sufficiently already, when I described its *Extract*.

The *Spirit of Wine* draws out the subtiler part of all these Ingredients, and leaves the more terreltrious.

I use to draw the *Extract of Scammony* by its self, for greater ease, this *Extract* is properly a *Rosine*.

Purgative Remedies are divided into *Melanagogues*, *Phlegmagogues*, and *Cholagogues*. By *Melanagogues* are understood those that chiefly purge *Melancholy*, by *Phlegmagogues* those that purge *Phlegm*, and by *Cholagogues* those that evacuate *Choler*; so then by mixing these three sorts of Remedies, a Composition is made that is called *Panchymagogue*, that is to say, purging all the humours, as doth the *Extract* I have described.

Now to explicate the action of Purgative Remedies on all the several humours, you must consider in the first place, that *Melancholy* is a very tartarous humour, and full of fixt Salts; that the *Pituita* is very viscous, and descending from the Brain sticks like Glue to the internal Membrane of the *Viscera*, and that *Choler* is very thin and apt to rarifie.

It is likewise remarkable that the Remedies which are called *Melanagogue*, such as *Scammony*, *Senna*, &c. are full of Lixivious Salts, which are very good Dissolvents of the Melancholick humour contained in the lower parts, in that these sort of Remedies do always descend, and being strong purgers, do raise a Fermentation wherever they come.

Phleg-

Phlegmagogues, such as *Agarick*, *Coloquintida*, &c. do purge the *Pblegm* chiefly that is contained in the Brain, because these Remedies are full of volatile parts which easily sublime thither by means of the Natural Heat, and rarifying this humour do make it come down by the ordinary ways of Purgation.

Cholagogues, such as *Cassia*, *Rhubarb*, &c. which are mild Remedies, and are not strong enough to excite so great a Fermentation as the others, do only purge *Choler*, it being very soluble, and easie to ferment; but they are not able to reach *Melancholy*, or *Pblegm*, by reason of their thickness; so then there's no need of wondring, why a greater Evacuation of *Choler* than other humours is effected by these Remedies.

It is further observable, that the Remedies which purge the *Pituita* and *Melancholy*, do remain, or leave their impression in the body a longer time than those that purge *Choler*, because they more abound in Spirits or Salts: Moreover it is not to be imagined, that these *Phlegmagogues*, and *Melanagogues* do evacuate no *Choler* at all, for they drive out all they can meet with, but because it is then mixt with other humours, it appears not so plainly as when it is wrought upon alone.

C H A P. XVI.

Of Turpentine.

THere are two Trees that *Turpentine* comes from, by Incision, to wit, the *Turpentine Tree*, and the *Larix*, or *Larch Tree*; there are a great many of both sorts in hot Countries, such as *Italy*, *Provence*, nay, and in *Dauphiné*.

Turpentine is properly a Liquid Rosine in consistence of Balsom, that which is brought out of the *Isle of Chios* is best esteemed, and is also the dearest; that which we commonly use, and is called *Venice Turpentine*, must be clear, transparent, fragrant, and a little biting on the tast: it is used like a Balsom for Wounds, it is very Diuretick, taken inwardly, and is therefore given in *Gonorrheas*, in *Bolus*, or else dissolved in some Liquor by means of a little Yelk of an Egg, it gives the Urine a smell much like Violets. It is often boiled in Water, and then becomes solid like Rosine, and being so prepared is made up into pills, the Dose is from half a drachm to a drachm, if one takes too much of it, it gives the Head-ach.

Distilla

Distillation of Turpentine.

Take three pounds of good *Turpentine*, and pour it into an Earthen Retort, or Glass one luted, large enough to remain half empty. Add to it a handful of Stupe, to prevent the thicker parts of the *Turpentine* from rising when the Liquor distills; you must cleanse the inside of the neck of the Retort, and place it in a Furnace to distill in an open fire; fit to it a Receiver, and luting the junctures, begin the Distillation with a very small fire only to warm the Retort, and drive out a *Volatile Spirit*, after which augment the fire by degrees, there will come forth first a *clear Oyl*, then a *yellow Oyl*, and at last a *red Oyl*; take care to separate these Liquors as they do distill, and when you see the *red Oyl* begin to come thick, take away the fire, and when the vessels are cool, unlute them. Keep all these Liquors separately in Vials.

The *Volatile Spirit* is an excellent Aperitive, it is given from four to twelve drops in some appropriate Liquor, to expell Gravel out of the Reins or Ureters, in the Nephritick Colick, or to dissolve Viscosities, it is likewise used in *Gonorrhoeas*.

The first *Oyl* serves for the same uses as the *Spirit*; the second and third do serve for a Balsom to consolidate Wounds, discuss tumours, and fortifie the Nerves.

Break the Retort, and you'll find in it a Mass,

melt and strain it to separate the Stupe ; it is a good *Colophone* , and is used in plaisters to dry and consolidate.

After this manner may be distilled *Rosines*, *Maſtick*, *Frankincenſe*, *Tacamahaca*, *Gum Elemi*, *Varniſh*, *Labdanum*, and other *Gums* of this nature.

Remarks.

The *Spirit of Turpentine* is properly an *Ethereal Oyl* mixed with a little *Phlegm* and *Acid Eſſential Salt*, which renders it *Aperitive*, it is this *Spirit* that gives *Turpentine* its ſmell.

A great deal of fire is requiſite to draw the laſt *Oyl*, and it becomes *Red*, through ſome *Fuſiginosities* that fall upon it, before it comes out of the *Retort*.

If you ſhould continue to carry on the fire, until there comes no more *Liquor*, you'd find in the *Retort* nothing but a little light, and very rarified *Matter* that's good for nothing.

The *Oyl of Turpentine* that is bought at the *Druggiſts*, is a mixture of *Spirit*, and *Yellow Oyl*.

It is commonly ſaid that by mixing the *Oyl of Turpentine*, and that of *Vitriol*, there riſes a very conſiderable efferveſcency, but I could never find it true, though I have mixed them ſeveral times.

C H A P. XVII.

Of Benjamin.

B *Benjamin* called by some *Assa Dulcis*, is a Rosine that distills from a great Tree in Foreign Countries, the name of it is unknown, though many please to call it *Laserpitium*; this Tree is very common in *Samaria*, and many other adjacent Countries.

Benjamin is very much used by Perfumers, and it hath use too in Physick, to resist the malignity of humours and fortifie the Heart and Brain; you must choose it clean, friable, and full of white spots, and such as that is called *Amygdalodes*.

Flowers of Benjamin, and its Oyl.

Take an Earthen Pot, high and narrow, with a border round it, put into it three or four ounces of clean *Benjamin* grossly powdered; cover the Pot with a Coffin of Paper, and tye it round about under the border; set the Pot in warm Ashes, and when the *Benjamin* is heated, the *Flowers* will *sublime*; take off the Coffin every two hours, and fix another in its place; stop up quickly in a Glass the *Flowers* you find in the Coffins, and when those which afterwards *sublime* do begin to appear

appear Oily, take the Pot off the fire; put that which remains into a little Glass Retort, and fitting a Receiver to it, distill in a Sand-heat a thick and fragrant Oyl until nothing more comes out, there will remain in the Retort nothing but a very spongy earth.

The *Flowers* are good for Asthmatical persons, and to fortifie the Stomach; the Dose is from two grains to five in an Egg, or Lozenges. The Oyl is a Balsom for Wounds and Ulcers.

Remarks.

Benjamin being full of a great many volatile parts, easily sublimes over the smallest fire; the *Flowers* rise in little needles exceeding white; but if you give never so little fire more than should be, they carry along with them a small quantity of Oyl, which makes them Yellow and Impure. You must therefore perform the Operation in Hot Ashes, or Sand, to have the *Flowers* fair.

Tincture of Benjamin.

Take three ounces of *Benjamin*, and half an ounce of *Storax*, powder them grossly, and put them into a Bottle, or Matrafs half-empty, pour upon it a Pint of *Spirit of Wine*, stop your vessel close, and set it in warm Horse-dung, leave it in Digestion for a Fortnight, after which filtrate

trate the Liquor, and keep it in a Viol well stopt: some do add to it five or six drops of *Balsom of Peru*, to better its smell: it is good to take away spots in the Face, a drachm of it is put into four ounces of Water, and it whitens like Milk, this Water serves for a Wash, and is called *Virgin's Milk*.

Remarks.

This *Tincture* is a dissolution of the Rosine of *Benjamin* made in *Spirit of Wine*. When it is mixed in a great deal of Water, it presently makes a *Milk*, because Water weakens the *Spirit of Wine*, and makes it quit what it held up dissolved. If you let this *Milk* settle, the *Rosine* precipitates to the bottom of the vessel, and the Water turns clear.

The *Storax* is added to this *Tincture*, to encrease the goodness of the smell.

C H A P. XVIII.

Of Camphire.

Camphire is a *Rosine* that distils drop by drop from a great Tree much like a Walnut-Tree in the Island *Borneo* in *Asia*. Little Cakes of it are likewise brought out of *China*, but that is not so good ; it must be chosen White, Transparent, clean, fryable, without spot, and such as is hard to quench, when once lighted.

Camphire is compounded of a *Sulphur* and *Salt* so exceeding Volatile, that it is very hard to keep it any time, and it always loses something, let it be never so closely stopt.

It is an excellent Remedy for the Fits of the Mother, it is not only smelt to by Women in this condition, and used in their Clysters, but also taken inwardly ; for it is lighted, and then quenched five or six times in some Water proper to the Distemper, and so the Water is given to drink ; it is likewise good for intermittent Fevers, being hung about the neck, because in its evaporating away, it insensibly enters through the Pores, and causes a Rarefaction, and Transpiration of the humor which caused the Disease : and for the same reason it is that several Druggs applied to the Wrists and other places, have often cured Diseases : but you must observe that
this

this sort of Remedies is always of a very Spirituous nature. *Camphire* is dissolved in *Spirit of Wine*, and this Dissolution is called *Spirit of Wine Camphorized*, it is good in the Apoplexy, and Hysterical Maladies; it is also found to be of excellent use in the Tooth-ach, a little Cotton is dipt into it, and put into the aking Tooth.

Oil of Camphire.

Powder grossly three or four ounces of good *Camphire*, put it into a Matraass, and pour upon it twice as much *Spirit of Nitre*, stop your Vessel close, and set it over a Pot half full of water a little warmed; stir it ever now and then, to help forward the dissolution which will be finished in two or three hours, and then you'll find the *Camphire* turned into a clear *Oil* which swims above the *Spirit*, separate it and keep it in a Viol well stopd.

It is used for the Rottenness of Bones, and to touch Nerves that are uncovered in Wounds.

Remarks.

This *Oil* is nothing else but the meer dissolution of *Camphire* in *Spirit of Niter*; for if you pour some water upon it to destroy the force of the *Spirit*, it returns into *Camphire* as before.

Of all the *Rosines* this is the only one that can be dissolved by *Spirit of Niter*.

This

This dissolution is made without any Ebullition, or sensible heat, because the *Camphire* consisting of thin loose parts, *Acids* do enter among them and make an easie separation: again *Acids* mixing with *Sulphurs* never raise any Ebullition, because they find those bodies too pliant and yielding, to make any resistance.

The *Spirit of Niter* which remains hath lost much of its strength.

CHAP. XIX.

Of Gumm Ammoniack.

Gumm Ammoniack is so called, because it distils from a sort of *Ferula* that grows near the place where the *Oracle of Jupiter Ammon* stood heretofore; the best is in large yellowish tears, and white within.

It is given inwardly in Deoppilative Electuaries for Schirrhus Tumors of the Liver, Spleen, and Mesentery; it is used in Emollient and Attractive Plaisters.

The way to Purifie it is to dissolve it in *Vinegar*, then passing it through a cloth all the moisture is evaporated away over the fire: by this means it is cleansed from some straws or other little impurities that it contained. But some part
of

of its *Volatile Spirits* are evaporated at the same time, and in them consists its greatest virtue, while some others are fixed by the *Acid* which always puts a stop to the motion of *Volatiles*. Wherefore I would never advise this *Purification*; I would rather, after choosing it as clean as may be, only powder it in a Mortar, to mix it with what may be thought fit; for though there should be some little straws in it, that would never be able to alter the Remedy, or diminish its virtue so much as doth the destruction of its *Volatile Salts* by *Vinegar*.

The same thing may be considered in the use of all other *Gumms*; and if some of them, as *Galbanum* and *Opopanax*, are too moist to be powdered, you may cut them into little slices, and dry them in the Sun.

Distillation of Gumm Ammoniack.

Put a pound of *Gumm Ammoniack* into an earthen Retort, or glass one luted, great enough for two thirds to remain empty; place this Retort in a Reverberatory Furnace, and fitting to it a Receiver, begin the Distillation with a very little fire to warm gently the Retort, and drive out drop by drop a little Phlegmatick water. When the vapours begin to appear, throw out that which is in the Receiver, and refitting it, and luting close the junctures, encrease the fire by degrees, and continue it until all is come. Then let the vessels cool, and unlute them; pour out
that

that which is in the Receiver into a Funnel lined with brown paper, the *Spirit* will pass through, and leave the thick black *Oil* in the Filter, keep it in a Viol : it is good for the Palsie, and Hysterical Diseases : the distempered parts are rub'd with it, and it is given to women to smell at.

Put the *Spirit* into a glass *Limbeck*, and Rectifie it by distilling it in a Sand-heat. 'Tis a good Remedy against the Plague, and all sorts of Malignant Diseases ; it is used for the Scurvy, and all manner of Obstructions, the Dose is from eight to sixteen drops in some appropriate Liquor.

The *Spirit* of all other *Gumms* may be drawn after the same manner.

Remarks.

Two Thirds of the Retort must remain empty, because the *Gumm* rarifies exceedingly as it heats, and would be apt to come forth in substance, if it had not room enough. There's no need of adding *Alkali's* for the Rectification of this *Spirit*, as many Authors have been willing to perswade us ; this circumstance doth rather more hurt than good, because *Alkalies* do spoil these sorts of *Spirits*, as I have said when I treated of the Rectification of the *Spirit* of *Tartar*.

vigour. The Cold kills 'em. They differ from other Serpents in that they don't grow so much; they have two Teeth on the sides of their Jaws, and those very long, in comparison with a great many little ones that are round about, and the Gum of each of those long Teeth is full of a Yellowish Juyce, in which many do think their venom consists; now Serpents have none of those long Teeth, but only little ones.

Again, they differ in that being taken up by the Tails, they can't wind themselves like Serpents, to make such circumvolutions about the Arm, or Tongs that hold them, and this by reason of the different connexion of their Vertebraes.

The biting of *Vipers* is more dangerous than that of other Serpents, but the most quick and assured Remedy that can be used upon it, is to crush the Head of the *Animal*, and lay it on the Wound, because by opening of the Pores it lets out the venomous Spirits that were got in. The Bit Person may likewise take the *Volatile Salt of Vipers*, as I shall shew hereafter.

It is not yet known wherein consists the venom of *Vipers*, nor can any good substantial reason be given of the accidents which happen after the Biting. Most Men think this Malignity consists in the *enraged Spirits*. And this is the Opinion of *Van-Helmont*, and *Poterius*, according to the relation of *Zwelfer* in his Remarks upon the *Augustan Dispensatory*, where he speaks of the *Troches of Vipers*: He saith there have been a great many eminent Men who have confirmed this Opinion with Curious Observations, on the Bitings

tings of *Enraged Animals*, particularly of Man, of the Cat, Wolf, Horse, Dog, Weafil, &c. And among others *Fabritius Hildanus* in his Operations of Chirurgery, to whose proofs he thinks nothing further can be added to confirm the truth of this Opinion: If accidents, saith he, do happen, that are sometimes more severe, and sometimes less, they must be attributed only to more or less provocation and anger, or sometimes to a more profound or slighter Biting of these *Animals*. This Opinion seems likewise to have been confirmed by some Experiments, which *Monsieur Charas* relates in his Book of *Vipers*, where he shews not only that the *Enraged Spirits* are the sole poison of the *Viper*, but also pretends that the *Yellow Juyce* which is found in the hollow part of the Jaw, wherein the great Tooth is fastned, and was supposed to be the venom of this *Animal*, is no such matter; for having poured some of this Liquor on the Wounds of several Beasts, not one of them died, nay further that those Persons who had ventured to tast it, never found any inconvenience from it. Nevertheless *Monsieur Redy* in a particular Treatise on the *Viper* will not grant the truth of these Experiments.

On the contrary he maintains, that having put some of this *Yellow Juyce* on the Wounds of divers sorts of *Animals*, they soon died of it, and thence concludes that the venom of *Vipers* consists in the *Yellow Juyce*, and not in the *Enraged Spirits* only, as the others have been willing to think, he taking this cause alone to be too Metaphysical.

And in truth who would believe that the *Idea* which this *Animal* forms, when he finds himself provoked, should be able to imprint on the *Spirits* qualities so malignant?

Now in so great an opposition of Opinions and Experiments, a certain great Man of these Times found a way to reconcile them, by affirming that the *Yellow Juice* of *Vipers* did produce different effects, according to the several places where these *Animals* lived; so that *Monsieur Redy* might have found the *Yellow Juice* to be venomous in *Italy*, whereas in *France*, where the Climate is not so hot, this *Juice* doth not shew any poisonous quality, unless it be quickned by the *Angry Spirits* of the *Viper*, which gives it a sufficient penetration.

Others do confidently assure us they have seen several *Animals* in *France* die, soon after they had put some of this *Yellow Liquor* into the Wounds they had made on purpose, which very much favours the assertion of *Monsieur Redy*.

Furthermore as for what is related, that in *France* People have ventured to tast this *Yellow Liquor* without any harm, I find this not to be a convincing proof that it is no poison; for although the *Spirit of Vitriol*, for example, or some other Acid, do not use to prove Mortal, when taken inwardly, nevertheless if the same quantity should be syringed into the Veins, the *Animal* falls presently into Convulsions and dies. Now as that which caused the *Spirit of Vitriol* taken inwardly not to be poison was this; the Acids grow weak through the mixture of the *Saliva*,
and

and before ever they come to mix in the Mass of Bloud, its parts do receive so great an alteration from the ferment of the places they must pass through, that they are able to do nothing else at most but cool the Body: so the same may be said of the *Yellow Liquor* of the *Viper*, when it is tasted of, that besides its mixture with the Liquors of the Mouth and Stomach, it receives divers alterations from the ferments of the places it must pass through, before it enters into the Mass of Bloud.

Many do likewise think that the venom of *Vipers* hath its chief seat in the *Gall*, and thence is easily transported to the Gums, when they are angry; nevertheless in the Anatomy of this *Animal* there's no passage found capable of such a translation. I know very well that the Pores of living Bodies may be said to be so open, that all manner of Liquors may be presumed to pass through them, but no mischievous effect is discovered to proceed from the *Viper's Gall* when given inwardly, for it only makes one sweat.

Lastly, Others will have the *Viper's* Venom dispersed over all its Body. And those who think thus, do advise us to whip these *Animals* in a warm Bason to drive their venom into the extremities, before we cut (as is usually done) their *Heads* two fingers below, and their *Tailes* two fingers above; after that, to flea off the Skin, and take out the Bowels, and then boil the Body in Water, wherein are added Salt, and Dill, to correct, as they say, the remaining malignity. When the flesh is tender, it is separated from the bones,

then to eight ounces of this Flesh beaten into a Paste in a Marble Mortar are added two ounces of Bread dried and powdered, and *Troches* made of it, which being dried are kept for occasion.

But this long Preparation is seldom used, since Experience hath taught us, that no part of a dead *Viper* is at all poisonous. The *Head* and *Tayl* dried and powdered may be taken for a *Cordial*, as well as the rest of the Body. I can likewise assure you, upon my own Experience, that the *Tooth* of a dead *Viper* is no ways venomous, having by chance been prickt my self till the Bloud came, whilst I was a handling the *Heads* of *Vipers* newly kill'd that I had a mind to dry, and there did not follow the least ill accident.

Furthermore by this Coction the *Vipers* flesh is deprived of its *Volatile Salts*, which gave its greatest virtue; for they dissolve in the Broth, which is flung away, and only the *Faces* remain, wherein there hardly rests so much *Cordial* virtue as there does in the Bread which is mixed for a *Corrective*.

But there's no need I should enlarge my self further on this subject, because these *Observations* are sufficiently delivered in the *Augustan Pharmacopœia*, and besides *Monsieur Charas* relates them very faithfully in his Book.

Wherefore I conceive it is much better to use the *Powder of Vipers* fresh made, than the *Troches*.

To make this *Powder* well, it is good to choose *Vipers*, when they are in the prime of their strength; the Females that are full of Eggs
or

or Young ones, are not so good as the others: their *Heads* are to be cut off, their *Skins* thrown by, and their *Bowels* taken out, and so they are set a drying in the shade, afterwards powdered in a Mortar.

But because this *Powder* is hard to keep, in that Worms breed in it, 'twill be good to make it into a Paste with a sufficient quantity of the mucilage of *Gum Tragacanth*, so form it into *Troches*, dry them, and powder them when there's occasion to use them. And thus it keeps well a long time.

This *Powder* is given in the Small-Pox, Malignant Feavers, and all other Maladies where Alexipharmicks are required, and the humours are to be purified by Perspiration; the Dose is from eight grains to thirty in Broth, or some other convenient Liquor.

The *Heart* and *Liver* are dried in the Sun, and powdered together, and this *Powder* called *Animal Bezoard*, it hath the same virtues as the Body of the *Viper*, only it is given in a little lesser Dose.

The *Gall* of *Vipers* provokes Sweat; the Dose is a drop or two in *Carduus* Water.

The *Fat* that's found in them is melted, then strained for to separate it from the membranes it sticks to, 'tis as clear as Oyl. Several Countries do use it in the Small-pox, and Feavers: The Dose is from one drop to six in Broth, or some other convenient Liquor.

Distillation of Vipers.

Take twelve dozen of *Vipers* dried in the shade, as I said before, put them into an Earthen Retort, or Glafs one Coated, place it in a Reverberatory Furnace, fit to it a great capacious Receiver, and luting the Junctures close, begin the Distillation with a small fire to warm the Retort gently, and drive out a Phlegmatick Water drop by drop; when you see no more drops fall, encrease the fire a little, and *Spirits* will come forth which will fill the Receiver with white Clouds, and you'll see at last a black *Oyl* come, and the *Volatile Salt* stick to the sides of the Receiver. Continue the fire until there comes no more, after which let the Vessels cool, and then unlute them. Shake about the Receiver a little, to loosen the *Volatile Salt* from the sides, and pour it all into a Matraass with a long neck, fit to it a Head, and a small Receiver, and lute the junctures with a wet Bladder; you must set your Vessel in Sand, and with a gentle fire under it, the *Volatile Salt* will sublime, and stick to the Head, and uppermost part of the Matraass, separate it and keep it in a Viol well stoppt.

'Tis one of the very best Remedies we have in Physick, it is good for Malignant Feavers, and Agues, the Pox, Apoplexy, Epilepsie, Palsie, Hysterical Maladies, and the Bitings of all venomous Beasts; the Dose is from six to sixteen grains in some appropriate Liquor.

Pour

Pour that which remains in the Matrafs into a Funnel lined with brown Paper, the *Spirit* and *Phlegm* will pass through, and the stinking *Oyl* remain behind; Hysterical Women may smell to it, to allay their vapours, and Paralytical parts may be anointed therewith; but its smell is so nauseous that it's hard to endure it.

Pour the *Spirit* and *Phlegm* mixed confusedly together into a *Limbeck*, and distill in a vaporous Bath about half the Liquor, you'll have a *Spirit* that must be kept well stopt, it hath the same virtues as the *Salt*; the Dose is from ten to thirty drops.

The *Phlegm* must be flung away.

If that which remains in the Retort is Calcined in an open fire, and a *Lixivium* made of it, as I said concerning fixt Alkali Salts, a small quantity of fixt Salt will remain, which nevertheless hath no more virtue than other Alkali Salts I spoke of before.

The *Volatile Salts* of Harts-Horn, the Bloud, Skull, Nails, Hair, and other parts of *Animals* may be drawn after the same manner.

Remarks.

The Receiver must be sure to be large enough, that the *Spirits* may circulate with greater ease, the fire must likewise be well managed; for these *Spirits* being forced out too fast do rush forth violently, and break the Receiver, or else are lost through the junctures.

The

The *Phlegm* comes before the other Principles in the first Distillation, but in the Rectification the *Volatile Salt* rises first, because it is at liberty, and lighter than the *Phlegm*.

The *Spirit* which is drawn from *Animals* by the Art of Chymistry is nothing but a *Volatile Salt* dissolved in *Phlegm*.

Your Vessel for Sublimation must be very high, that the *Volatile Salt* may rise without any *Phlegm*, for when the Vessel is short, the *Phlegm* riseth with the *Volatile Salt*, liquifies it, and turns it into *Spirit*. A Matraass, or a long Cucurbite with its Head, may serve for this Operation, because the *Phlegm* being too heavy cannot mount up so high, and therefore leaves the *Volatile Salt* to sublime all alone, which may nevertheless be Rectified to become more pure; you must mix it with the Distilled *Spirit*, and repeat the Sublimation according as I have said: but because this *Salt* always carries along with it a small quantity of *Oil*, a few days afterwards it loses its whiteness, and turns Yellowish: now to avoid that, you must pour upon it, when it is in the bottle, *Spirit of Wine Tartarised* one fingers height, and so keep it well stopt. This *Spirit of Wine* hinders the *Salt* from dissolving its self and the *Oyl* it contained, so that after some daies it turns red, and the *Salt* grows white; when it is to be used, the *Spirit* is poured off by Inclination, and the *Salt* left alone: by means of this Lotion it loses a little of its former smell; but care must be taken that the *Spirit of Wine* be well Rectified, for if there remained any the least *Phlegm*, the *Salt* would dissolve in it. The

The *Volatile Salt* dissolved in a little water Crystallizes like Sugar-Candy, and then it is easier to keep than before.

There can be drawn from *Animals* but an exceeding small quantity of *Fixt Salt*, because the *Spirits* which abound in them do *Volatilize* this *Salt*.

The vertue of *Animals* doth principally consist in their *Volatile Salt*, it is that which gives meat its savour, that makes Broths strong, and turns them into a Gelly, according as they do abound more or less. The *Consummata* which are made over a small fire are better than those that are boiled quick, because a strong fire carries away good part of the *Volatile Salts*.

Volatile Salts do rarifie the humors of the body, both by reason of their piercing nature, and also in that being Alkalis they dull the strength of Acids, which kept the humors condensed, after which the Bloud being in greater motion than before, doth the more easily purifie it self, either by perspiration or by Urine, from Heterogeneous bodies that did there gather together.

This Operation may serve to shew how the *Volatile Salt* of all *Animals*, or any part of them, may be drawn. When the *Volatile Salt* of *Bloud* is to be drawn, that of the best colour must be taken and dried in the Sun, or else over an extrem small fire, and so distilled like *Vipers*.

All *Volatile Salts* have much resemblance in their figure, smell and taste, but that of *Vipers* is accounted the most active, and proper against Poisons; those of *Harts-Horn*, and *Mans-Skull*
are

are thought to be better than others for the Epilepsie, that of *Mans Bloud* to purifie the Bloud, and so of the rest.

CHAP. II.

Distillation of Urine, and its Volatile Salt.

TAKE ten or twelve quarts of *Urine* newly made by sound young men, evaporate the moisture in an earthen or glass Cucurbite in a Sand-heat, until it remains in the consistence of Honey; then fit a Head with its Receiver, and luting the junctures close, continue a small fire to distil away the rest of the *Phlegm*, after which encrease it by little and little, and the Spirits will rise up in Clouds, carrying along with them a little *Oyl*, and after that the *Volatile Salt*, which will stick to the Head like a company of Butterflies; continue the fire until there comes no more; then unlute the Vessels, and separating the *Volatile Salt*, put it into a Matraass with a long neck, pour likewise into it the Spirit that is in the Receiver, and fit a Blind-Head to the Matraass; lute the junctures with a wet Bladder, and setting your Matraass in Sand, *sublime* with a small fire all the *Volatile Salt*, as I shewed concerning that of *Vipers*; separate this Salt, and keep it in

a Viol well stoppt. It is a good Remedy for Quartan Agues, and Malignant Feavers, it opens all Obstructions, and works both by Urine and Sweat: the Dose is from six to sixteen grains in some convenient Liquor; filtrate that which remains in the Matrafs, the Spirit will pass through the Filter, while a small quantity of black and extraordinary stinking Oyl remains, it is good to discuss cold Tumors, and to give to Hysterical Women to smell to.

You may distil the Spirit in a Sand-heat to separate it from a thick matter that remains at bottom, it hath the same virtues as the Salt; it is given from eight to twenty drops in some appropriate Liquor.

Two Drachms of it are mixed with two ounces of *Aqua-vita*, to rub Paralytical parts with it; it is likewise used for cold Pains, and for the *Sciatica*.

If the Mass that remains in the Cucurbite should be Calcined and a *Lixivium* made of it with water, a very small quantity of Fixt Alkali Salt might be gotten from evaporating the moisture, and it hath the same virtues as other Alkali Salts.

Remarks.

The *Urine* of young men is to be prefer'd before others, because it contains more *Salt*. It must be newly made, and evaporated over a gentle fire, that the Fermentation, or too much heat, may not cause the *Volatile Salts* to rise with

with the *Phlegm*. The *Spirit* is only a *Volatile Salt* dissolved in a little *Phlegm*; this *Volatile Salt* works more by *Urine* than any of the rest, but its smell is more offensive.

This Remedy must never be given in Broth, for whereas the Broth must be taken warm, the heat evaporates some of the *Volatile Salts*, before it can reach the mouth.

A *Volatile Salt* may be drawn from *Urine*, after setting it some months Fermenting in a Vessel close stopt, and then a third part of the Liquor must be distilled with a gentle fire; it is in this *Distilled Urine*, that the *Volatile Salt* will be found exalted by the Fermentation. Rectifie this Liquor again three or four times in a Limbeck, throwing away each Distillation the *Phlegm* that remains at the bottom of the Cucurbite; then putting your *Spirit of Urine* into a Matrafs with its Head, Sublime the *Volatile Salt* as I shewed before. Some do add to it *Salt-peter*.

This *Salt* is of a more penetrating nature than the other, but a great deal of time is required to make it.

C H A P. III.

Of Honey.

Honey is compounded of the most Balsamick substance of several Flowers, which the Bees do separate and carry into their Hives for nourishment. They do gather up and order this Honey by an artifice most admirable, as if they took special care to make provision against Winter, and thereby they give way to the Fermentation which sends to the sides the grosser part like unto a Tartar, and called Wax, the Honey being found in the middle; the best to the taste is the White, but for Physick the Yellow is the better, as containing more Spirits than the other; it must be of a middling consistence, that is to say, neither too hard, nor too clear.

A Hydromel is prepared for Diseases of the Breast.

Vinous Hydromel is made of *Water* and *clarified Honey*, then the Liquor is put to Ferment in a Vessel in the Sun, until 'tis grown as strong as *Spanish Wine*; then a Spirit may be drawn from it. Thus *Hydromel* will grow as sower as *Wine* does.

Distilla

Distillation of Honey.

Put four pounds of good *Honey* into a large earthen Cucurbite, and distil away the watry part in a moderate Sand-heat, until Acid drops begin to come; then take away the fire, and keep this *Water* in a bottle; it is good to make the hair grow, you must either wet your Comb with it every day, or else dip a piece of Sponge into it, and therewith soak the roots of the hair.

Take that which remains in the Cucurbite, put it into an earthen Retort, or glass one Coated, but one that's large enough for two thirds to remain empty, and place your Retort in a Reverberatory Furnace; then fitting a large Receiver, and luting the junctures close, begin the Distillation with a small fire for three hours only to warm the Retort; then encrease it by little and little, *Spirits* will come forth with a little black *Oil*, and fill the Receiver with Clouds; continue the fire until all is come out that will, unlute the Vessels, and separate the *Spirit* from the black and stinking *Oil* in a Funnel lined with brown paper, there is but very little *Oil*, keep them both in Viols.

The *Spirit* is an excellent Aperitive, some of it may be dropt into Juleps, to give an agreeable acidity.

The *Spirit* may be Rectified by distilling it in a Sand-heat in a Glass Cucurbite, and that which rises last may be kept apart as the strongest of all;
it

it is used to cleanse old Ulcers, and eat proud flesh.

The *Oil* is good to be used in the Rottenness of Bones.

There remains in the Retort only a light and Spungious substance, from which nothing more can be drawn.

Remarks.

The Vessels must be exceeding large for the *Distillation of Honey*, because a great deal of vacuity is required for it to rarifie in.

The *Water of Honey* makes the Hair grow, because it opens the Pores; some do use to mix it with the *Juyce* of an *Onion* to render it the more effectual.

C H A P. IV.

Distillation of Wax.

Melt two pounds of *Yellow Wax* in an Earthen Pot, and mix with it three or four pounds of *Potters-earth* powdered, or so much as is requisite to make a Paste of it, form it into little pellets, and put them into an earthen Retort,

Y

or

or Glass one Coated, a third of which remains empty; place this Retort in a Reverberatory Furnace; fit to it a Receiver, and luting the junctures, give a small fire at first, and there will come forth *Phlegm*, then a *Spirit*; encrease the fire a little, and a *Liquor* will distill that congeals in the Receiver like *Butter*; continue the fire till nothing more comes forth; then unlute the junctures, separate the *Spirit* mixed with *Phlegm* from the *Butter*, and keep it in a Viol well stoppt. 'Tis a good opener; the Dose is from ten drops to twenty in *Raddish* water, or some other appropriate *Liquor*.

Some do use the *Butter of Wax* to discuss Tumours, rather than the *Oyl* that I am going to describe.

Melt the *Butter of Wax* in an Earthen Pot, and make a Paste of it with sufficient quantity of *Bolus* or Potters-earth powdered; form this Paste into little Pellets, put them into a Glass-Retort, set your Retort in a Sand-heat, fit to it a Receiver, and luting the junctures, begin the Distillation with a small fire, a great many *Spirits* will come forth mixed with *Phlegm*, after which encrease it a little, and a clear yellow *Oyl* will come; having distill'd about three ounces of it, change the Receiver, for that which comes at last is as thick as *Butter*. It may be Rectified with other Clay, or Potters-earth, and it will change into as transparent an *Oyl* as the other. Separate the *Oyl* from the *Spirit*, and keep it in a Viol. It is a good discutient for Tumours, and Cold Pains: it is mixed in Unguents and Oyls for that purpose.

The

The *Oyl of Wax* may be Rectified several other times to get it still clearer than before.

Remarks.

The solid consistence of *Wax* doth proceed from a proportionate mixture of *Water*, *Volatile Salt*, and *Oyl*, united and incorporated strictly together; wherefore the solidity comes to be destroyed, according as the *Principles* do suffer a separation; and this is easily observed in the *Rectifications*, for every *Distillation* that is made, some considerable quantity of aqueous parts are separated, and the *Oyl* becomes clearer.

The *Spirit of Wax* is a *Volatile Salt* dissolved in *Phlegm*.

The *Clay* serves only to separate the parts of *Wax*, and rarifie it the more.

The *Oyl of Wax* discusses by reason of the *Volatile Salt* it contains.

FINIS.

The oil of water is to be distilled in a still
 until it get to the bottom then below.

REMARKS

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I N D E X
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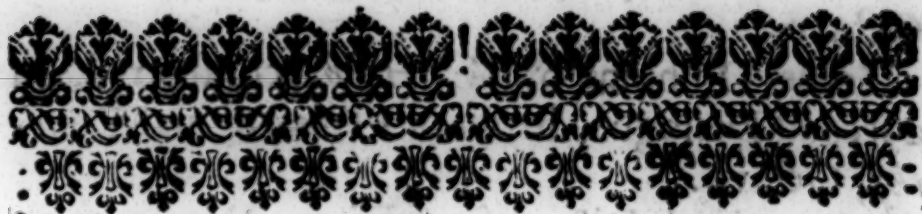
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APPENDIX
TO A
COURSE
OF
Chymistry.

BEING
Additional REMARKS
To the former
OPERATIONS.
TOGETHER WITH
The Process of the *Volatile Salt of Tartar*,
and some other *Useful Preparations*.

Writ in FRENCH by Monsieur
NICHOLAS LEMERY.

Translated by WALTER HARRIS
Doctor of-PHYSICK.

L O N D O N,
Printed for *Walter Kettilby* at the *Bishop's*
Head in *St. Paul's Church-Yard*, 1680.

APPENDIX

A H T

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Chymistry.

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THE PREFACE.

READER,

THE Course of Chymistry, to which this is an Appendix, was received so well, that I shall forbear using many reasons, why I now cause this to be Published. I am sure all such as have more in them of the Physician than Chymist, and whose designs are Truly and Methodically to Cure, by having laid a Solid Foundation for Physick by good Principles, and who do not expect as many Miracles from a Spirit, or Salt, as some Women boast of from a simple Receipt for the Ague, or the like; such Rational Physicians, I dare say, will gladly enough receive some hints of this Appendix. The Gentleman, though a Chymist to the purpose, and one that has spared no manner of pains to find out the Mysteries of this Art, yet is so extreamly Candid, as to speak of Chymical Remedies, like a third person unconcerned, any further than real truth lies at stake. He makes few Panegyricks of the Remedies herein, or before mentioned, and discourses of them so, as to search out their nature by nothing but matter of fact, and rejecting all No-

THE PREFACE.

notions that his hand cannot touch, or his eye see. This present Supplement is the effect of his working Brain, since the first Edition of his Book, of which the Translation was made, the Author having since sent me two other Editions, out of which I have collected these Additions, for your further Curiosity. One thing particularly is here taken notice of, which I can never repent the reading, nor the being an instrument in making it better known; it is, that divers things do by Calcination and Distillation not only receive an impression of fire, but even fiery parts into their composition to a very great quantity, nay to a considerable augmentation of their weight and substance.

If you Calcine Lead in a Crucible, although you see a great many Vapours arise out of the matter during the Calcination, yet the Calx being at last weighed, will be found considerably heavier than the Lead was at first, which the wit of man can never explicate, but by admitting the reception of fiery parts into the Calx, see p. 33, 34.

Calcine four ounces of the common Regulus of Antimony, stirring it all the while with a Spatule, there will rise up a vapour for an hour and halfs time, or thereabouts, and when it fumes no longer, weigh it, and there will be two drachms and a half more than the Regulus weighed at first, see p. 60.

Distil in a Retort the Burning Spirit of Saturn out of Salt of Saturn, and let the Salt you distil be six ounces, you'll thence draw an ounce and six drachms of liquor, and there will remain in the Retort six ounces and six drachms of matter.

Now

THE PREFACE.

Now nothing in nature can here make this Addition of two ounces and a half, but the entrance of Fire, fire imbodied into the matter, see p. 35. of this Appendix.

The instances here mention'd may suffice to prove, how that subtil, dangerous, and too active Principle, Fire, does predominate in abundance of Remedies, that are commonly used. I shall add one word concerning the manner of the Distillation of Acid Spirits, by which we may the better guess at their Nature and Capacity. A Retort is placed so in a Furnace, that the Fire may Reverberate, or beat back again upon the vessel, great fires are kindled, and continued for 2, 3, 4 dayes together, they are made as exceeding violent as Art can make them, the Retort and the Ingredients in it, if you look into the Furnace, do all appear of a live coal, they turn into as true a fire as the Wood it self, and there seems to be not the least difference but in the Figure, and thus by the violent force of this most active, vigorous, searching, but destructive Principle, Fire, the acid Spirits are driven out into a large Receiver, in White or Red clouds, and there having room to play a while, they at last condense into fiery Spirits, or a spirituous fire. These Spirits, when the vessels are cold, are taken out, and stop't up carefully (hardly any thing but glass stopples will serve the turn) and though they are fixt Spirits, the fire contained in them will needs tend upwards, and afterwards, as occasion serves, these nimble Spirits are not only used for Dissolution of Metals (which they do well for) but are given Christians

THE PREFACE.

istians inwardly, too too often, nay, by some Chymical Practisers, especially such as love Chymistry so dearly, that they are in continual hopes of the Philosophers stone, these same Spirits shall be given with as much freedom, and as little regret of Conscience as a draught of Small beer.

Now does it not deserve serious consideration what these Spirits are made of, what is the nature of fire taken inwardly, and what miraculous effects must needs happen from these elaborate, and so powerful remedies! Nature is a tender thing, and must be used very gently if you would help her, she's a composition of flesh and bloud, and uses wonderful moderation in every thing she does; offer her any thing injurious or distasteful, and she's never quiet till she has thrown it off; a draught of Milk and water will do her good to the very heart, when her functions are disturb'd, and she pants for burning heat. I know you may force her to be contented with Acid, cooling, (and yet fiery) Spirits given in Juleps, or the like, but whether they are really agreeable and beneficial to Nature, we may have no small reason to doubt.

I know the common universal practice of the world now-a-daies will plead more for Acids than any thing I can say against them. Yet this is plain to my understanding, that all Big-worded Remedies, and such as are most popular, have their certain Fate, they have their beginning, their time of flourishing, and their Period. Once Spirit of Salt was all in all, every body must be dropping it into their drink. Now 'tis almost forgot; other Master-pieces in Quackery have come in its place.

Who

THE PREFACE.

Who would have thought lately, that Rabels drops (supposed to be Oyl of Vitriol sweetned) should so soon be no more talkt of? One would have thought at first, that this wonderful Monsieur would have spoiled utterly every Physicians practice, and that they would have had no more to do, be so Monopolized the whole Art by his Remedy. And yet we see he's return'd long since for France, and Physicians are just where they were before his coming.

I would not be understood, by what I have said, to condemn the use of Natural Acids, the Acid Ferment of the Stomach speaks their excellency sufficiently, and want of Appetite is immediately assisted by them; and besides all, Natural salts, of which Aliments are full, are known to be Acid, and there is no other salt in nature, but the Acid, as is at large proved in the following Treatise. So that Acids have their use, and benefit beyond question. But it is the frequent and continual use of Artificial Acids, such as are drawn by fire, and become of a fiery nature, that I presume to tax and question. A Citron in a Feaver may be of greater help and comfort, and allay the boiling Heat, and resist the prevailing malignity, more than can be thought. The Juyce of Lemmons, not that crude Juyce, which is commonly vended, and of which the Syrop is too too often made, but the Juyce of good Lemmons, and so of Oranges, might be put into Juleps to give them an Acidity, instead of Spirit of Vitriol, and no harm done. But a few drops, forsooth, of that suspected Spirit are more gentile, and neat, and, for the great honour of Chymistry, are grown into common use, almost as much as salt for our meat.

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Natural Remedies will prevail, when we have tried as many pretty conceits as we please. Nature will provide us Herbs and Roots, when Chymists, and Chymistry, as to great part of it, are dead and buried, and have undergone the same Fate that all particular Remedies of Hectors, and great Boasters have hitherto done, by the wise disposal of all-seeing Providence. They dye commonly with their Masters, or if they do outlive their thread of time, they soon decline more and more, till they come to lose all their Esteem.

Nevertheless upon urgent occasions, when Symptoms are exceeding violent, and are not to be conquer'd with ordinary means, Acid Spirits may, and perhaps ought to be used. As in a Pox or Gonorrhea, when Defluxions are violent, and Symptoms accidentally high, when the Patient is almost in despair, and frightned with unusual Symptoms, we must have recourse to Mercury, let us say what we will, and exhibite that quantity which otherwise we should not, if the person had been rightly treated at first; as we are forced to use Actual Cauteries, to prevent Gangrenes, and burn to the purpose, when there's a necessity for it: So in cases of the like nature, the disguised fire in Acids may be given inwardly, with safety enough. Pestilential Feavers, where the Bloud is wholly fluid, and the Fibres that gave it consistence, and made it condense, when grown cold, are destroyed by the Subtile Malignity, may perhaps require better or stronger Acids than Vinegar can give.

Having

THE PREFACE.

Having spoken thus much in reference to Acid fiery Spirits, it may well be enquired, whether or no in the Distillation of such Spirits, there is any addition of weight, as there is most sensibly in the instances forenamed. To which I Answer, that Acid Spirits come forth with such Heat and Violence, that it is almost Impossible to lute the Junctures so exactly well, as not to lose some of them, they are so exceeding fiery, and of so piercing a nature, that some of them will break out, do what you can. How will a room smell of Nitrous Spirits, while they are a Distilling! they'l try what Lungs you are made of, let the Receiver be never so big or thick. And this is the reason, that the Ingredients weigh no more than when they were first put in; for as fast as the fire comes in through the Retort, some Spirits break out at the Junctures.

To prove the nature of these Spirits to be as Hot as I say, I could here instance an Experiment of this Author. 'Twas in short this: he Distilled Vitriol three dayes and three nights together, and there came forth an Acid Spirit, as it uses to do; when the vessels were cold, he found in the Receiver nothing but a Mass of salt, or Oyl of Vitriol congealed. This salt was so exceeding Caustick, that if he offered to touch the least part of it, it burnt like fire, and he was fain immediately to put his hand in water; and when he threw a little of it into the water, it made just such a hissing noise as burning coals do; it likewise made the water very hot, hotter than common Oyl of Vitriol will do. See p. 94, 95.

And

THE PREFACE.

And now I have done with Acids, it will be expedient to speak something of Alkali's. Knife and Sheeth go together. Alkali salts, whether they be made by burning Plants into Ashes, or by Calcination in a Retort or Crucible, and so making of them a Lixivium, &c. they all lose the nature they were endowed with at first, and from Natural Acid Salts become Porous; the fire by opening them drives out the Acid part, and leaves them full of Pores, ready to receive, and make an Ebullition with any Acids they shall afterwards meet with; they are partly the remaining terrestrious, and fixt part of what they were, and partly an additional supplement of fire.

Now there are Natural Alkali's (though not Alkali salts) which perform the good effect of Alkali's, such as Perle, Coral, Crabs-eyes, &c. and these may be used to answer the Indication of sweetning Acids, without any need of having recourse to those productions of fire, to wit, Alkali salts, unless there be extraordinary occasion; as I said before concerning the use of Natural Acids, unless the greatness of Symptoms required the Artificial.

Speaking to this purpose to a most Ingenious Physician, he was pleased to ask me, whether I did not Roast, and Boil the meat that I eat, or whether that did terrifie me from eating my meat. But I think there's a great deal of difference between a warmer sort of Infusion, as Boiling is, and heat at a distance, which in a leisure tract of time dries, and prepares meat to be fit for the Stomach, which insinuates gently, and which loses

THE PREFACE.

loses the destructive quality of fire, by reason of the distance, as is the manner of Roasting; there's a vast difference, I say, between these Heats, and turning Ingredients into a Coal fire, as is done both in Retorts and Crucibles in the making of Artificial acids and alkali's. And as for meat, I cannot much approve, and few Physicians, I think, do, that which is Broil'd on the Coals, and so nearly partakes of the Impression of fire; it digests ill, I am sure, and breeds Melancholick unwholsome nourishment.

Chymical Digestions are of most excellent use, to draw out the True and Natural virtue of things; they are made in a Sand heat, or else in a Balneum, mild and tender wayes of opening bodies, and the Remedies lay no such force upon Nature, as upon the Disease. Remedies were at first ordered by Nature so well, as to need but little of our help, they were intended to help those poor harmless souls, who knew no better than to make an ordinary fire to keep themselves warm by, and these could gather a proper Herb to heat, or boil in a little water, and there often came rare feats of it too.

Volatile Spirits and Salts do rise with a gentler fire, and may for that good reason claim preference to all Fixt Alkali's, whether Spirits or Salts. Upon great occasions they will seem to work Miracles, raise Dead to Life, and when the mild flame of the Bloud, (in which Life is said to consist) seems to be quite extinguished, these Volatile Spirits shall light it again a-fresh, and add new vigour to the languishing efforts of Nature.

But

THE PREFACE.

But these Volatiles too must be given with great caution, either the humours must be Prepared, or the Spirits very low, or else they may Translate the humours to the Brain, from the parts below, and give the Disease a Nobler Seat than it had before.

The Spirit of Sal Armoniack is an excellent thing, and though it is derived from Urinous, and seeming uncleanly Principles, yet if well drawn and rectified from Phlegm, has oftentimes great effects, and especially if Cohobated upon Castor and Amber, will yield to few Volatiles, unless that most Noble nay Royal Preparation of Goddard's drops, Prepared by that Ingenious and Learned Physician, Dr. Goodall; who upon enquiry into the nature of these Medicines, has been so free as to acquaint me, that they are separated with that moderate and gentle degree of fire, that the Balneum, in which the Glass bodies are placed, are never to exceed the heat of humane blood circulating in the vessels, or that of an Egg, upon Incubation: by which means there is a most exact, and even Natural separation of the Volatile and Spirituous parts, from the fixt and Phlegmatick. Whereas if this mild degree of heat were not observ'd, he saies the Principles would be confounded together. After this, the several Principles, with which this Noble Preparation is endowed, are by much labour, and proper degrees of heat, both in their repeated Sublimations, Rectifications, and Circulations, made all with a gentle fire, advanced to that degree of Volatility, that I have reason to esteem it one of the best
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THE PREFACE.

Nervous, Cephalick, and Hysterick Medicines, that is used in Chymistry, and much more effectual than others to answer all those Indications in our Art, where Volatiles, or Diaphoreticks are thought to be useful. Of this Preparation there are several sorts, differing secundum magis & minus, being Impregnated with one or more of the Original constituent Principles, in a higher or lower degree; so that they may be the better suited to variety of Constitutions, and answer very different Indications.

Perhaps some will say, I Prevaricate with my Design, in Prefacing such Cautions to a Book of Chymistry, and making great part of Chymistry a little too much suspected; and especially considering what I said in praise of this Art before the **COURSE OF CHYMISTRY**. But I would have it consider'd, that I never thought this sort of Remedies of much use in Feavers, and that Chronical distempers might possibly find some greater relief from those Active Medicines, especially after the tryal of others, by virtue of that *Maxime, à mitioribus ad fortiora progredendum*. These things may require some longer Discourse, and perhaps I may urge them further hereafter, when I may speak more at large concerning Remedies, and give some Practical Observations upon them. What I have now said, is not intended to discourage from using them upon very great occasions; only if plain things will do, what need we puzzle? where we can use safe, and innocent Remedies, such as are Natural, and in the way of Nature, easily Prepared, why should we
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THE PREFACE.

Neglect them, for sake of such as are, or may prove dangerous? For my part, I shall never so pin my Practice to the Authority of any one, no nor many Great Names, that I must forfeit the use of my own Reason, and Observation. What does good, I'll follow, though a silly Ignorant should teach me; what does bad, I'll avoid, though never so Magisterial.

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T O
A COURSE of CHYMISTRY,
CONTAINING

The easiest manner of performing those Operations that are in use in Physick.

ADD to Page 6. Line 26. In the Remarks upon the Principles of Chymistry. Nothing but the Oyl, can properly be said to be *Inflammable*, and the Oyl is so much the more so, as the Salts, with which it is closely united, have been more or less spiritualized. For that which I call Spirit in the Oyl, is nothing but an *Essential* or *Volatile Salt*; this Salt is not of it self *Inflammable*, but serves to Rarefie and Exalt the parts of the Oyl to render them the more susceptible of Motion, and consequently of *Flagration*; after the same manner as when Salt-peter is put to mix with some Oily substance, this Oily matter fires much more easily than when it is alone; though Salt-peter of it self is not at all *Inflammable*, as I shall prove hereafter. We have Examples of the truth of what I say in Spirit of Wine, Oyl of Turpentine,
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and all other Inflammable Liquors; for they are only *Oyls* subtilized and refined by the Volatile Salts they contain. Sticks, and other parts of Vegetables have a great deal of Salt much like to Salt-peter; this Salt being straitly united with their Oyl makes them the more apt to flame, than if it had not been a part. The Fat of Animals is full of a Volatile Acid salt; Wax, Rosine, and all other matters that are inflammable, are impregnated with an *Acid Salt, Essential or Volatile*.

I say the *Salt* which causes the *flagration* of *Oyls*, must be either *Volatile* or *Essential*, for if it were a *fixt Salt*, 'twould have a contrary effect, it would allay in some measure the quick motion of the parts of an Inflammable body; and this we see happens when *Sea-salt* is flung into the fire, it serves to put it out. *Common Sulphur* yields us another instance of the same kind: consisting of one part Sulphurous or Oily, and another Saline or fixt Acid, which plainly appears in the opening of it, the Oily part fires, and would soon rise like other Oyls into a great White Flame, but that the Acid part being a load to its activity hinders it from rising, and so forces it to cast but only a small Blew Flame; and a proof of what I affirm may be had from mixing *Salt-peter* with *Sulphur*; for the *Volatile Salt* of *Salt-peter* does *Volatilize* the *Salts* of *Sulphur*, and causes a White flame to burn violently, as I shall shew hereafter in the Operation of *Salt Polychrest*.

Add to *Pag. 7. Lin. 22.* Is it not likely enough that the bottom of the *Sea*, or its shores, may be much like the surface of the Earth we inhabit, and that there may be Mountains, Rocks, different sorts of earth, and consequently *inexhaustible Mountains of Salt* in a Million of places at the bottom of the *Sea*, whence it receives its Brackishness?

And it may be there are Waters, which after taking Salt from several earths, do at last discharge themselves into the sea through an infinite number of subterranean channels, which do much contribute likewise to making Sea-water salt.

That which confirms me in this opinion is, because there are *Lakes* in *Italy*, *Germany*, *Egypt*, the *Indies*, and many other places, which are as *Salt* as the *Sea*, and can have no other cause but that their waters have hapned to run through *Mines of Salt*.

I doubt not but many will be apt to object against my Opinion, that the *Sea* being of so prodigious boundless an extent, all the *Salt* I have spoken of, would not be able to salt it as it is; but if they please to consider, that this great extent of the Ocean may meet with *Mines of Salt* in abundance of places, and what is once dissolved can never be separated from it, I am persuaded their doubt will soon vanish. Add to what is said, that *Sea-water* does not contain so great a quantity of *Salt* as is commonly imagined: and this is easily prov'd, if you take the pains to

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evaporate some of it over the fire, or dissolve salt in that water; for it will receive a considerable quantity into it, which is a certain sign, that the water was not so salt before, as it might have been, for if it had been impregnated with as much as it could, 'twould have dissolved no more.

Therefore we have good reason to believe, that the *Sea*, which may be called a large *Lake*, becomes *Salt* through the *Mines* that are therein, and the *Salt Currents* that in several places empty into it.

Add to *Pag. 7. Lin. 30.* It may be objected that *Salt-peter* is found in places where no *Acid* liquor can be thought to come; but no body can doubt but that there is an *Acid* in the *Air*, which though a very insensible body, is able enough to enter into *Stones* and *Earths*, the truth whereof is seen every day in *Earths* that have lost their *Salt* as much as could be drawn by Art, which upon being exposed some time to the open air get new additions of *Salt*, and encrease their weight considerably. Now the liquor that I speak of, which runs in some places of the earth, receives its *Acidity* from this *Acid Spirit* of the *Air*, which condenses in some places better than in others, by reason of the coolness, or some other disposition it finds there.

I conceive therefore that *Salt-peter* is form'd in *Stones* and *Earths* by the *Acid Spirit* of the *Air*, after the same manner as *Sal Gemme* in *Mines* by an *Acid* liquor, and that this *Aerial Acid*

Acia entring insensibly into the body of *Stones* produces a Salt at first much like *Sal Gemme*; but afterwards new *Acid Spirits* still coming and mixing with it makes it of a middle nature between *Volatile* and *Fixt*. And it is for this reason that a great deal of *Salt-peter* is taken from old ruined buildings, for the *Stones* there continuing a long time exposed to the *Air*, receive greater quantity of *Spirits* than other stones; it is likewise to be found in Cellars and other places where the Sun casts no heat, because the *Spirit* of the *Air* does there easily condense by reason of the coolness and moisture.

Add to *Pag. 8. line 3.* All *Earths* being impregnated with an *Acid Salt*, as I have said, 'tis not hard to conceive how that the *Salt* of *Vegetables* is communicated to them from the *earth* wherein they grew. Their *Growth* must needs have proceeded from a *Salt juice* of the *Earth* they grew in, which having opened the *Seed* through the Fermentation it caused, insinuates and filters it self into the *Fibers* that constitute the *Plant*; and the leaving grounds *Fallow* some years, is in order to preserve and retain the *Salt* that is continually encreased in them by the *Acid Spirit* of the *Air*. Likewise *Dung*, and other matters, which are said to fatten and fructifie *Lands*, do so by nothing else but their *Salt*. Neither need we wonder at the barrenness of *Sandy* and *stony* soils, for that the *Acia* of the *Air* cannot unite and fix with them in sufficient quantity to render them fertile. Ne-

vertheless 'tis worth observation, that there are Lands which remain barren too through too great an abundance of *Salt* they contain, and for this reason in *Egypt* they are forced to temper their grounds with *Sand* after the Ebbing of the River *Nile*, to make them Fertile; because the *Earth*, 'till that is done, is so full of *Salt*, that its pores are quite choaked up with it. So that instead of causing any *Fermentation* in the *Seed*, the *Salt* fixes and depresses it, that it can't have its motion free enough to rarifie, and raise a stalk; but now when *Sand* is mingled with it, it is able to divide and extend the *Salt*, which not having then such power of *fixing* the *Seed*, it Ferments and rises into a *Plant*. Whence it may be seen, that *too much Salt* is as Offensive to the Earths fertility, as *too little*, and that it is the same thing with other Fermentable matters as it is with Earths, they come to ferment by means of a *moderate quantity* of *Salt* mixed with them, for if you add too much, the Fermentation will be spoil'd.

Again, every kind of *Salt* is not fit to fertilize lands, it must be a *Volatile Salt*, or *approaching* to the nature of *Salt-peter*, to serve for Vegetation; a *Salt* too *fixt* would rather spoil it, and it has been observ'd that places which should fructifie, have brought forth nothing, when *Sea-salt* has been sprinkled upon them; the reason of which is for that this *Fixt Salt* hinders the Fermentation that was necessary to produce fertility.

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Nevertheless it sometimes happens, that the *Ashes of Vegetables*, though full of a *fixt salt*, do serve to *fertilize*; and, this Countrey-men are well acquainted with, who in some places where they find their Lands too lean and barren to yield any thing without assistance of Art, do use at certain seasons of the year to burn *Fern* and *Turfs* upon them, and spread about the *Ashes*. Now it is by reason of a *Lixivious salt* in the *Ashes*, that the *Lands* are hereby improv'd.

But this happens for the same reason as I said before, for the *fixt salt* of *Vegetables* that lies in the *Ashes* is very *Porous*, as I shall prove hereafter; and so does very well mix with the *Spirits* or *Acid Salts* of the *Air*, and turns easily into *Salt-peter*, as when the *Spirit* of *Salt-peter* mixt with an *Alkali salt*, makes a good *Salt-peter*.

As for *sea-salt*, possibly it might happen, that if it were left in the *Earth* for some considerable time, 'twould impregnate with the *Spirit* of the *Air*, and so being at length *Volatilized* would render a place fertile. But because it is a very compact body, and its parts closely united, the *Volatilizing* of it would be a tedious business, and so the present requisite *Fermentation* failing, the place would remain barren too long to gratifie our expectations.

'Tis very likely that the *Volatile* or *Nitrous salt* meets in the *Earth* with some *Sulphurous* or fat matter, that is continually raised by the *Subterranean* heat toward the *Surface* of the *Earth*, and unites with it. This mixture of a *Volatile*

salt and *Sulphur* together may much contribute towards explicating the manner of *Vegetation*; for just as the mixture of *Sulphur* and *Salt-peter* does excellently dispose to an *Exaltation* by heat, which will not happen while they are separated; so the Bituminous or fat part of the earth mixing with *Salt-peter*, which all Earths have, the subterranean heat exalts them much more easily, than if the *Salt* were alone. And now let us see what happens from this *Exaltation* to the production of Plants.

Some part of this *Sulphurous salt*, meeting with *seed* in the earth proper to grow, does enter into the *seed*, and cause a Fermentation, that is to say, *suppling* the parts of the *seed*, disposes it to open it self. Now 'tis very certain, and what has been sensibly demonstrated by *Microscopes*, that each *grain* of *seed* contains in little the whole *Plant* with all its parts. Wherefore this opening the body of the *seed* is by reason that the *sulphurous salts* entring at the pores of the *Root* of this *small Plant*, and by their Volatile quality insinuating all along the *Fibres* which constitute the *Plant*, do orderly display before us what was before but very confused in respect of us.

These *salts* do never enter at the head of the *Plant*, and so descend to the *Root*, though often the *Root* of the *Seed* lies uppermost, and the head or stalk downwards, because the Pores of the stalk are not of such a Figure as is proper to receive them, whereas those of the *Root* have a proper contexture.

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The *Volatility* of these *Salts* does also cause the stalk, though seated downwards, to rise upwards, and follow their tendency, which is always up; and this is that which by extending and enlarging the Fibres of the Plant, makes it grow to that height which their nature requires.

'Tis probable that this fat part of earth insinuating with the *salt*, as I have said, does make the *Oyl* of a mixt body; for we find that those matters which help best to fertilize, are full of *Volatile salt* and *Oyl*, as *Dung*, *Urine*, and *Plants* corrupted.

'Tis fit to observe here, that the *salt* does act after another-guise manner than the *Oyl* in hindring the Fermentation or corruption of the matter 'tis mixed with; for it does not only stop the pores, and hinder the air from entring, but fixes it likewise by its hooked parts, that it can neither have motion nor rarefaction, for which reason 'tis that *Meat* is *salted* in order to keep it *sweet*, and does thereby remain firm and compact for some time.

Three kinds of *salt* are drawn from *Vegetables*, an *Acid salt* called *Essential*, a *Volatile*, and a *Fixt salt*. The first is like *Salt-peter*, and sometimes like *Tartar*, according as it contains more or less earth; this *salt* is drawn from the *juice* of the *Plant*, as I said before; for after expression and purifying this *juice*, 'tis set in a vessel in some cool place a few daies without stirring, and the *salt* shoots into *Crystals* all about. This *Acid salt* may be said to be the *true salt* that was in the *Plant*, because the means that

that are used in drawing it are *Natural*, and such as cannot change its nature ; but this can't be said of those others, because the violent fires that are used about them make impressions of another nature, and their effects are very different, so that the fire seems to alter and disguise them, as I shall shew in the following discourse.

The second salt, or the *Volatile salt* of *Plants* is usually drawn from *seeds* or *fruits* Fermenting. While it remains in the *Vegetable*, it differs from the *Essential salt* only in this, that being driven up higher by *Spirits*, it becomes more *Volatile*. The *Fermentation* that is caused in fruits by beating and bruising them, does very much assist in *Volatilizing* the salt ; for it sets the particles at work, and disposes them for an easier separation ; but it happens that in the great circulation, or continual motion this salt is in, it unites so strongly with the *Oyl* that Fruits and Seeds are full of, that they can't be separated by *Crystallizing* the juice, as they can in drawing them from other parts of the *Plant*. We must therefore have recourse to the help of fire. The *Fruit* or *seed* which contains the *Volatile salt*, as I shall prove in its proper place, is Distilled by a *Retort*, and *Water* comes forth in the first place, then an *Oyl*, and lastly a most keen ill scented *Salt* (that easily flies away) upon encreasing the fire to purpose, is driven into the *Receiver*. Now 'tis plain that fire has changed, or else added some thing to this salt ; for when 'twas in the *Plant*, it had no manner of *smell* like that it gets by *distillation*. But to shew there's

a strange *Alteration* in this *salt*, as soon as 'tis mixed with an *Acid*, there presently appears an *Ebullition*, or *Effervescency*, which remains until the *Acid* has thoroughly entred into the *salt*. Which circumstance does not happen to it in its *Natural* being, 'tis this *Ebullition* that gave it the name of a *Volatile Alkali*, to distinguish it from a *Fixt Alkali*, of which I shall speak hereafter. The *Chymists* will needs have this *Volatile Alkali* to be in the *Plant*, just the same as when it is drawn; that is to say, they make this a different *species* of *salt*, lying hid under the *Acid*, until it is laid open by the force of fire. But this opinion is founded on no credible experience, for *Anatomize* the *Plant* how you think fit, without using fire, and you shall never find any other but an *Acid salt*. Doubtless 'twill be said, that all other ways of dissecting *Plants* even into their *salts*, prove too weak without the assistance of this *grand dissolvent* fire. But if we consider impartially how fire acts, we shall be forc'd to acknowledge that it rather destroyes, and confounds the greatest part of the bodies it opens, and does not leave them in the *natural* state they were in before, and especially when 'tis driven with that force which is necessary to draw this *salt*. So that I see no reason why the *Species* of things should be *multiplied* without necessity, by admitting many kinds of *salts* in *Plants*, and I conceive with much more probability, that the *Volatile Alkali salt* is a part of the *Acid Essential salt* I spoke of, which having been first disposed to a *Volatile* nature, and afterwards driven by

by the force of fire, draws along with it a portion of *Empyreumatical Oyl*, that gives it such a disagreeable smell, and some terrestrious calcined matter, with which it is so strongly united, and which changes its nature, by breaking the *Saline* points, and rendring them *Porous*, so that any *Acid* liquor being cast upon it, enters into the *Pores* and violently divides the parts, whence follows the *Effervescency*. Perchance likewise this *Calx* or Calcined earth may have retained igneous particles, and so the edges of the *Acid* beginning to open the *Pores* of *Salt*, these little igneous bodies being in a violent motion do strike about, and break open all their small prisons, and from thence it may be, the violent *Ebullition* happens. Such as are prejudiced with the Sentiments of ancient *Chymists*, will relish very hardly this new Opinion of mine; but I am perswaded if any one will take the pains to examine the matter near at hand, and make some *Experiments* on the *salts* of *Plants*, he shall find my Discourse come near enough to truth.

The last *salt* or the *sixt salt* of *Plants* remains united with the earthy part after *Distillation* of the other substances; the matter is taken out of the *Retort*, and calcined in an open fire, for to free it from the *soot* that blackens it; afterwards the *salt* is drawn by a *Lixivium* as I have shewn before. This *salt* is called *sixt*, in comparison with others, because this can't *sublime*.

The *Chymists* do assure us, but with little foundation for it, that in Terrestrial bodies, in *Metalls*, *Corals*, *Pearls*, and generally in all bodies

bodies that Ferment with *Acids*, there is an hidden *Alkali* in them, which is one of the *Principles* of *Fermentation*, wherefore they give them the name of *Alkali's*; but because no manner of *Salt* can be drawn from them, to prove their Opinion, and they have no other rational Argument to perswade me, they must give me leave to think otherwise than they have done, and I conceive that the contrary to what they have established will serve me better to explicate the truth.

Following therefore the *Principle* I have laid, I believe that those Terrestrial bodies are themselves *Alkali's*, rather than that the *Ebullition* of *Acid* and *Alkali* proceeds from a *salt* supposed to be contained in them; and further that the *salts* are never *Alkali's* till they have undergone the force of fire, and been reduced into a *Calx*. I have proved, speaking of the nature of *Volatile salt*, that the fire did very much change the substances of things; and as I have shewn there is good reason to think there is but only one *species* of *salt* in *Plants*, and the *Volatile salt* is but a change wrought by fire, I shall proceed upon the same *Principle*, and affirm that there is no fixt *Alkali salt* in *Plants*, but that by *Calcination* the fire has fixt a part of the *Acid Essential salt* with the earthy part that has serv'd to break the keenest of its points, and rendred them *Porous*, like a *Calx*. 'Tis by reason of these *Pores* that this kind of *salt* grows humid and melts so easily when exposed to the Air; and the Terrestrial parts do turn it into an *Alkali*, for if they

they were not mixed with it, 'twould continue still an *Acid salt*, and opposed to *Alkali*. But to clear up this point the better, we must consider as nicely as may be the nature of an *Acid* and an *Alkali*.

Whenas the nature of a thing so obscure as that of *salt*, can't better be explicated, than by admitting to its parts such figures as are answerable to the effects it produces; I shall affirm, that the *Acidity* of any liquor does consist in keen particles of *salts*, in motion; and I hope no body will offer to dispute whether an *Acid* has points or no, seeing every ones experience does demonstrate it, they need but taste an *Acid* to be satisfied of it, for it pricks the tongue like any thing keen and finely cut; but a demonstrative and convincing proof that an *Acid* does consist of pointed parts is, that not only all *Acid salts* do *Crystallize* into edges, but all Dissolutions of different things, caused by *acid liquors*, do assume this figure in their *Crystallization*; these *Crystals* consist of points differing both in length and bigness one from another, and this diversity must be attributed to the keener or blunter edges of the different sorts of *Acids*; and so likewise this difference of the points in subtilty is the cause that one *acid* can penetrate and dissolve well one sort of *mixture*, that another can't rarify at all: thus *Vinegar* dissolves *Lead*, which *aqua fortis* can't: *Aqua fortis* dissolves *Quick-silver*, which *Vinegar* will not touch; *Aqua Regalis* dissolves *Gold*, whenas *Aqua fortis* can't meddle with it; on the contrary *Aqua fortis*

fortis dissolves *Silver*, but can do nothing with *Gold*, and so the rest.

As for *Alkali's*, they are soon known by pouring an *Acid* upon them, for presently, or soon after, there rises a violent *Ebullition*, which remains until the *Acid* finds no more bodies to rarify. This effect may make us reasonably conjecture that an *Alkali* is a terrestrial and solid matter, whose pores are figured after such a manner that the *Acid* points entering into them do strike at and divide whatsoever opposes their motion, and according as the parts of which the *Alkali* is compounded, are more or less solid, the *Acids* finding more or less resistance, do cause a stronger or weaker *Ebullition*. So we see the *Effervescency* that happens in the dissolution of *Coral* is very much milder than that in the dissolution of *Silver*.

There are as many different *Alkali's*, as there are bodies that have different pores, and this is the reason why an *Acid* will Ferment one strongly, and another not at all; for there must be a due proportion between the *Acid* points, and the Pores of the *Alkali*.

The nature of *Alkali's* being thus established, there will be no need of flying to an imaginary salt in *Plants* for explication of the *Effervescency*; and 'twill be easily conceived that if an *Alkali salt* is full of a terrestrial matter that renders it porous like other *Alkali's*, it must cause an *Ebullition*. That which I said, speaking of *Volatile salts*, may here be added, that the Igneous particles breaking out through the Pores of the *Alkali*

Alkali salt, where they became imprisoned in the *Calcination*, do much contribute to the raising this *Effervescency*. And really when the *Acid Spirit* of *Vitriol*, or *Aqua fortis* is cast upon an *Alkali salt*, there happens as strong an *Ebullition*, as when this liquor is flung into the fire.

The *Fermentation* that happens to *Dow*, to *New Wine*, and such like things differs from that I now spoke of, in that it is more gentle, and slow; this is caused by the *Acid Natural salt* contained in them, which expanding and exalting it self by its motion, does rarifie and raise up the grosser and sulphurous part that endeavours to allay its motion, from whence it comes that the matter swells up.

The reason why an *Acid* does not make *Sulphurous* things Ferment, with so much noise and suddenness as *Alkali's*, is, because that *Oyls* consist of pliant parts that yield and make no resistance to the points of *Acids*, as a piece of *Wool* or *Cotton* will yield and give way to needles that are thrust into it. Thus methinks two sorts of *Fermentations* may be admitted of, the one of an *Acid* with an *Alkali*, which may be called *Ebullition*, and the other, when an *Acid* does by little and little rarifie some softish matter, as *Dow*, or clear and Sulphurous, as *Muste*, *Syder*, and all other juices of Plants. This last sort may rather be called *Fermentation*.

'Tis further remarkable that the *Acid* and *Alkali* do so destroy one another in their conflict, that when as much *Acid* has been by degrees

grees poured as is necessary to penetrate the *Alkali* in all its parts, it is then no more an *Alkali*, nor can it be so again, though you wash it to carry off the *Acid*, because it has no longer that disposition of *Pores* which is requisite in an *alkali*; and the *Acid* breaks and loses its points in the contest especially when the *alkali* is pretty compact and solid; so that if you would recover your *Acid* again, you'll find it has in a manner lost all its acidity, and retains only a sharpness. But the *Sulphur* or *Oyl* consisting of supple yielding parts does only receive some *Acid* impression, and no such close union, so that it can be drawn from *Sulphureous* bodies much the same as when it was mixt.

The *Salt* of *Animals* does differ but little from the *Volatile salt* of *Seeds* and *Fruits*, both which are drawn in a *Retort*; they have the same kind of smell, taste, and other virtues. The *Volatile salt* of *animals* keeps dry a longer time than the others, because it carries away with it more *fixt salt* than those others. As for *fixt salt*, *animals* do yield but a very little of it, and in some *animals* you shall find none at all; it is drawn as the *fixt salt* of *Plants*; they are both *alkali's*.

There is no *salt* that can be called *alkali*, to be found in the parts, or humors of *animals*, until they have passed the fire; a Saline serosity may be observed in them, but that *salt* is *acid*; and it proceeds doubtless from the *Aliments* that are taken for nourishment. Now as I have shewn that there is only an *acid salt* in *Earths*

and *Vegetables*, so I may say the same of *Animals*, and the rather because no other kind of *Salt* can be found in them in their *Natural* state, the *alkali salts* that are drawn from them, are only several mutations of an *Acid salt*, made by fire, which mingles with them earthy particles after the manner I have spoken of treating of the *Alkali's* of *Plants*. But it is observable, that whereas there is a greater proportion of *Spirits* in *Animals* than *Seeds*, these *Spirits* do serve to exalt all the *Salt*; which is the reason that less fixt salt is to be found in *Animals* than *Plants*.

As for what many do say that *Choler* causes an *Effervescency* like an *alkali*, when an *acid* is cast upon it, 'tis a mistake through want of right *Observation*, for no *Ebullition* at all happens for some time. Nevertheless I will not say, that an *Acid* produces no *Fermentation* in *Choler*, *Bloud*, and other parts of the body, for it does very often really do that; but that is no more than uses to be done in *New Wine*, *Beer*, and other liquors of the like nature. I have already explicated this sort of *Fermentation*.

We should not omit speaking of the *Congulation* that's made in *Milk* after a *Fermentation* caused either by *Heat*, or some *Acid* put into it.

It methinks here is no need at all of supposing an *Alkali salt*, that ferments with the *Acid* of this liquor, as many suppose for explicating this Effect, since if we consider but the natural composition of *Milk*, we shall find nothing but a
Creamy

Creamy substance swimming on the *Serum*, and mixed only superficially with it, by the intermixture of some *salt*; so that it is in a fitting state of separation, as soon as the *salt* gains a little more motion than it had, whether it be by *Fermentation*, or by encreasing its activity by an *acid* of its own nature. Thus when the *Heat* of the Summer, or fire has stirred up the *acid* that is in the *Milk*, or else some *acid* is poured into it, the edges of the *acid* do cut and divide the Creamy part, to gain a free motion in the *Serum*, and separate into *Curd* all the Butter and Cheese. Now there's no strangeness in the *Precipitation* of the *Curd*, especially when an *acid* has been poured upon the *Milk*, for besides the weight it gains by thickning, some part of the *acids* do mix with it, and encrease its weight; for according as the *acid* that was mingled is stronger or weaker, the *Curd* does *Precipitate* more or less.

Perhaps some will say, for as much as *acid* is always the cause of *Congulation* in *Milk*, there's no great likelihood that a *salt* of the same nature should be the instrument of uniting the several parts of *Milk*.

But it must be considered, that although there is an *acid* in *Milk* (as no body can doubt, seeing it sowers of it self, when stale) this *acid* is as it were tyed up in the ramous parts of the *Oyl*, so that there it loses all its motion and can't come to action; but by rarifying the *Oyl*, and making it fit to mix with the *serous* part; 'tis the due proportion of this *salt*, *Oyl*, and *serum*, that makes

makes the *Butter* and *Cheesy* part of *Milk*.

Now I hope I have said enough to establish what I have affirmed, that there's no *salt* in nature besides the *acid*, out of which all other *salts* are made, and that the *Alkali salt* has no *Natural existence* in mixt bodies. My discourse will be the better conceiv'd of, speaking of the Operations of *Chymistry*, and you'll find that by this *Principle*, which I may call the most *Natural* and disengaged of all that have been laid till now, I shall be able to give account of many *Phenomena's* that have never been explicated by common *Principles*.

Add to Pag. 19. lin. 1.

Of Minerals.

Whatsoever is found *Petrified* in the Earth, or on its surface, is called *Mineral*.

Petrification is made by a *Coagulation* of *acid* or *salt spirits*, that are found in the pores of the Earth.

This *Petrification* differs according to the divers dispositions, or different nature of the Earth; and according to the time that Nature uses in its perfection.

The growth of *Minerals* proceeds from an accumulation, or from several veins of congeled Waters, that do as it were glue together, and these veins are the cause that all the adjacent parts have their *Sinus*, and meetings a travers one another, and not running directly downwards.

These *Sinus*, like so many joints, are of great help to Labourers to cut in the Quarries; for
by

by those cavities the stones are in great measure separated before-hand, whereas 'twould be ex-tream hard working them out, if nature had not so concurred.

The growth of *Minerals* is very different from that of *Vegetables*, and *Animals*; for whereas the former does happen through an ag-glutination of congeled waters, as I have said; the latter is performed by means of *juyces* that insinuate and spread in the vessels and fibres, that *Animals* and *Plants* do consist of.

Metals do differ from *Minerals* in being *malleable*, which the others are not.

They are counted seven, *Gold*, *Sylver*, *Iron*, *Tinn*, *Copper*, *Lead*, and *Quicksylver*, this last is not *malleable* of it self, but is so mingled with the others; but because this is thought to be the *Seed* of *Metals*, 'tis numbred with the rest.

Astrologers have conceited that there was so great an affinity and correspondence between the Seven *Metals* before named, and the seven *Pla-nets*, that nothing happened to the one, but the other shared in it; they made this correspon-dence to happen through an infinite number of little bodies that past to and from each of them; and they suppose these corpuscles to be so figured that they can easily pass through the pores of the *Planet* and *Metal* they represent, but cannot en-ter into other bodies because their pores are not figured properly to receive them; or else if they do chance to get admittance into other bo-dies, they can't fix and stay there to contribute

any nourishment; for they do imagine that the *Metal* is *nourished* and perfected by the *Influence* that comes from its *Planet*, and so the *Planet* again the same from the *Metal*.

For these reasons they have given these seven *Metals* the name of the seven *Planets*, each accordingly as they are governed: and so have called *Gold* the *Sun*, *Sylver* the *Moon*, *Iron* *Mars*, *Quicksylver* *Mercury*, *Tinn* *Jupiter*, *Copper* *Venus*, and *Lead* *Saturn*.

They have likewise fancied that each of these *Planets* has his day apart to distribute liberally his *Influence* on our Hemisphere; and so they tell us that if we work upon *Sylver* on *Munday*, *Iron* on *Tuesday*, and so of the rest, we shall attain our end much better than on other daies.

Again they have taught us that the seven *Planets* do every one govern some particular principal part of our bodies; and because the *Metals* do represent the *Planets*, they must needs be mighty *specifick* in curing the distempers of those parts, and keeping them in good plight. Thus they have assigned the *Heart* to *Gold*, the *Head* to *Sylver*, the *Liver* to *Iron*, the *Lungs* to *Tinn*, the *Reins* to *Copper*, and the *Spleen* to *Lead*.

Thus you see in short what some of the *soberest Astrologers* do fancy concerning *Metals*, and they draw consequences from hence, which it would be too long here to relate. I have told you what the *soberest* among them say; for nothing can be so absurd as what some of them would have us believe.

¶Tis

'Tis no hard matter to disprove these conceits, and shew how groundless they are; for no body ever yet got near enough to the *Planets*, to satisfy himself whether they are really of the same nature with *Metals*, or whether any *Effluvi-ums* of bodies do fall from them to us.

Nevertheless some can conceit that these things are proved by *Experience*; but in truth there's nothing to confirm their Opinion, and we find it every day plain enough, that the Faculties and Virtues are utterly false, which they do attribute to the *Planets* and *Metals*; the *Metals* indeed are of good use in *Physick*, and excellent *Remedies* may be drawn from them; but their effects may better be explicated by Causes near at hand than the *Stars*.

Add to *Pag. 19. Lin. 10. Gold* is found in *Mines* in several places, both in *Europe*, and other parts of the World; it is usually attended with *Water* and very hard *stones*, such as are extream hard to dig; there are likewise several *stones* that contain particles of *Gold*, such as are called *Golden Marcassites*, the *Lapis Lazuli*, and *Lapis Armenus*.

Covetousness that has always prevail'd on the minds of men, has not forbore to possess the *Chymists* in hopes to make *Gold*; they have conceited that the production of *Gold* was the *End* that *Nature* always aims at in all her *Mines*, and that she's hindered in her design, as oft as she produces other *Metals* which are called *Imperfect*.

And upon this fancy they have spared no time, nor pains, nor cost, in exalting and perfecting these other *Metals*, and turning them into *Gold*; this is that which they call the *Grand Operation* of all, or the search after the *Philosophers stone*.

Some of them to compass their *End* do make a mixture of *Gold* with such other matters as serve to purifie them from their grosser parts, and work their *Preparations* with great fires, others do put them a *Digesting* in *Spirituous liquors*, in imitation of *Nature* that always uses a gentle Heat in her *Operations*, and so do reduce them into a state of *Corruption*, to draw thereby their *Mercury*, which they think to have the aptest disposition to turn into *Gold*. Others again do search after the *seed* of *Gold*, in *Gold* it self, and these make no doubt to find it there, as the *seed* of a *Vegetable* is more likely to be found in the *Vegetable* it self than otherwhere; in order to this they open the body of *Gold* by proper *Dissolvents*, then set it a *digesting* either by a *Lamp-fire*, or the *heat* of the *Sun*, or that of *Dung*, or some other degree of *Fire*, to be kept all along at an equal height, and such as is nearest to a *Natural* heat, and this to draw out the *Mercury* of *Gold*; for they are perswaded that if they could once obtain this same *Mercury*, sowing it in the *Earth*, it would bring forth *Gold*, as certainly as a *seed* does a *Plant*.

Another sort of these men do take wonderful pains to find out the *seed* of *Gold* in *Minerals*, as in *Antimony* for example, thinking there's a
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sulphur and *Mercury* in it as like to those in *Gold* as can be. Others hope to find it out in *Vegetables*, and things that come from them, as in *Honey*, *Manna*, *Sugar*, *Wine*, *Rosa solis*, *Rosemary*, *spleenwort*. And others are hot after it in *Animals*, and in their *Gums*, *Bloud*, *Urin*. But the most Curious and delicate of all, who think all the rest but Fools in comparison with them, do hunt after the seed of *Gold* in the *Sun*, and in the *Dew*; for the wisdom of *Astrologers* has found out that the *Sun* is a Body all of *Gold* melted in the Center of the World, and Coppel'd by the fire of the *stars* that environ it about, nay they dare affirm that this same *Gold* when it was a purifying did sparkle as *Gold* does in the *Coppel*.

I should never make an end of this subject, if I should speak of the labours, and pains, watchings, vexations and frettings, and especially the cost these unfortunate men do plunge themselves into, in following their several fancies; they are so extremely prepossessed with the conceit of becoming *Rich* all of a sudden, that they are altogether incapable of any sober admonition, and they shut their ears to any thing than can be said to disabuse them; so that all other *Philosophers*, that are not besotted with their fantastical opinions, are by them thought and called *Prophane*, reserving to themselves the name of the only *True Philosophers*, or *Philosophers paramount*.

But the saddest consideration of all is, to see a great many of them, who have spent all the flower of their years, in this desperate concern,
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in which nevertheless they pertinaciously run on, and consume all they have, at last instead of recompence for their miserable fatigues, reduced to the lowest degree of Poverty. *Penotus* will serve us for an instance of this nature, among thousands of others, he died a hundred years old wanting but two, in the *Hospital* of *Tverdon* in *Switzerland*, and he used to say before he died, having spent his whole life in vainly searching after the *Philosophers stone*, that if he had a mortal Enemy he did not dare to encounter openly, he would advise him above all things to give up himself to the *Study* and *Practice* of *Alchymy*.

Though I deny not absolutely, that some certain Artist, by a particular method, might have got the way of making *Gold* heretofore, nor that some body may be as lucky in time to come; yet there is more appearance of *Impossibility* than *Possibility* in the case, because of the small knowledge that any of us have of the *Natural Composition* of this *Mixt*; for seeing that *Gold* as well as *Silver* is drawn from *Mines* environed with *Waters*, it is very probable that these *Waters* do bring along with them some *Saline Principles* that congele and incorporate in *Earths* of a particular composition, and whose Pores are disposed in such a manner as 'tis impossible for *Art* to imitate. Nevertheless in order to make *Gold*, a perfect knowledge of the *Salts* that the *Waters* of the *Mines* do convey, is very requisite, as well as the disposition of the *Matrixes* or *Earths* in which they do congeal. Thus we see

see that working after Gold is working in the dark, and Alchymy seems very well defined by one thus : *Ars sine arte, cujus principium mentiri, medium laborare, & finis mendicare*, an Art without any Art, whose beginning is Lying, middle is nothing but Labour, and whose end is Beggery.

Gold taken inwardly is thought to be a most potent Cordial, because Astrologers tell us it receives its Influence from the Sun, which is as it were the Heart of the World, and by the communication of those Influences to the Heart, it serves to fortifie and cleanse it from all impurities; upon which ground a great many Operations have been invented in order to open this Metal, and separate its Sulphur from its Salt. Moreover this Operation by way of bravery is called *Aurum Potabile*, because this Salt or this Sulphur dissolving in a Liquor, can be taken by way of Potion: And because this *Aurum Potabile* can be thought to be distributed into all parts of the body, they fancy it can drive out every thing that interrupts the Functions of Nature, that it can free him that takes it from all fear of any Diseases for a long time, and can prolong life.

But this Opinion is built upon a weak foundation, and Experience does not confirm any of these great effects; for what assurance can one have or what Evidence is there, that the Sun is such a great friend of Gold, or that it bestows more Influences on it, than other mixt bodies; 'tis a thing that can never be prov'd, and
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we see that the *Sun* casts it light and heat in general upon all bodies, without making any difference. Who can understand, that the *Pores* of *Gold* are so disposed, as to have a greater facility of retaining the *Suns* Influences, than other *Metals* or things? This will be full as hard to prove as the other.

But though we should grant the *Astrologers* this supposition concerning the *Suns* Influence on *Gold*, the consequence they draw from it, that therefore it *Fortifies* the *Heart*, would be ne're a whit the truer; for all that we are able to apprehend in *Gold* is, that it is a most compact and weighty body, the union of whose *Principles* is extraordinary close; which is proved from hence, that no Art can instruct us to dissolve it *Radically*, so as to separate its *salt*, and its *sulphur*. This *Gold* being beaten into the thinnest *Leaves* that can be imagined, and taken inwardly receives not the least change in our bodies, and is voided the very same it was before, excepting when *Quicksilver* has been taken beforehand, for it unites with that, as I have said.

Wherefore we must conclude, that if *Gold* has received more *Influence* from the *Sun* than other *Metals*, yet it is never the fitter to dissolve in our Bodies, nor to produce those rare effects that are talkt of.

I know that *stories* are told to prove, that *Gold* does communicate virtue to the bodies of those who have taken it, and that it loses in the body some of its quantity; and among other *stories* 'tis said, that several persons, who had
fed

fed upon *Capons*, nourished with a *Paste* made of a mixture of *Vipers* and *Gold* together, have been cured that way of several *Diseases*; but there's a great deal more reason to attribute this effect rather to the *Vipers* than *Gold*; for we know by experience that *Vipers* taken inwardly without any thing else, do use to produce diverse sensible effects, whereas we observe none at all in *Gold*, when tis given alone.

As for the *Loss* of *Gold* in bodies, they prove it by their gathering together all the *Excrements* of those *Capons*, and *Calcining* them, for they could obtain again but the fourth part of the *Gold* that was used in the *Paste* the *Capons* had fed upon. But this proof is as weak as the former; for the *Excrements* of the *Capons* being full of a *Volatile Salt*, that *Salt* may have *Volatiliz'd* and carried away the greatest part of the *Gold* during the *Calcination*, after the same manner as we see several *Volatile* liquors to *sublime Gold*. I know well enough by my own Experience, that there are such *Volatiles* as are able to carry away *Gold*; for having one day mixed three ounces of *Gold* with about three pounds of matter consisting of diverse *Volatile Ingredients*, I put the mixture about a moneth afterwards into the *Coppell*, and the *Gold* appeared very resplendent in the middle of the mixture; but blowing, as we use to do, in its purification, I was astonished to see it *Exalt* away by little and little into the air, until there was not a grain of it left.

Thus

Thus no body can be assured that *Gold* did nourish those *Capons*; but besides, though some of it should be dissolved in the body, as it does in *Aqua Regalis*, which is very hard to conceive, though some of it should exalt, nay though some should plainly glitter in the *Chyle*, here's no proof nevertheless that it produces such wonderful effects.

Now although I have asserted that *Gold* taken alone does not receive any change as for health, yet I value very much several preparations of *Gold* made with *Spirits*; for 'tis these *Spirits* that give certain determinations to *Gold* according to their nature, and make it operate as it does. When I speak of *Aurum Fulminans*, I shall give an instance of what I now say.

Add to Pag. 29. The last line of the

Remarks upon *Aurum Fulminans*.

We need not fear lest *Aurum Fulminans* taken inwardly, and heated by the *stomach*, should cause such a *Detonation* there, as it does when set over the fire in a spoon; for so much the more moisture as comes to it, so much the less noise does it make. Now it can't be question'd, but there is liquidity enough in the *stomach*, besides the liquid vehicle 'tis usually given in. There is no need then of calling in the *acids* of the *stomach*, as some do, to unite with the *salts* of *Aurum Fulminans*, and drive them out of the body of this Metal; for besides that the most clear and disinterested

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Explications and such as fall most under our sense, ought always to be preferr'd, 'twould be too hard a matter to maintain that; 'tis true if you wet *Aurum Fulminans* with the spirit of *Vitriol*, or *Salt*, or *Sulphur*, the *Fulmination* is thereby hindred, but this happens from the acids fixing by their weight the *Volatility* of those *Salts* that remain in the *Pores* of the *Gold*.

In the *Chapter* of *Gold* I could reckon up several other Preparations that have been invented, but because they are out of use, I shall not swell this Book with an account of them.

Add to pag. 51.

Remarks upon the Magistery of *Bismuth*.

You must use a large *Bolt-head* to dissolve the *Bismuth* in, because the great *Ebullition* that happens, as soon as *Spirit of Niter* is cast upon it, requires room to move in. You must likewise have a care, as much as you can, of receiving the *Vapours* at your Nose or Mouth, for they are very offensive to the breast.

This quick and violent *Ebullition* proceeds from the acids quick penetration of the large pores of *Bismuth* as soon as thrown upon it, and the acid violently divides all that opposes its motion. It happens also that the *Bolt-head* grows so hot, that one can't endure ones hand upon it, because the points of the *Menstruum* do chase against the solid body of *Bismuth* with such force, that you may observe from thence much

much the same heat, as when two solid bodies are rub'd against one another. Add to this, that the great store of igneous particles contained in *Spirit of Niter*, may much increase this heat.

If the *Dissolution* becomes turbid through some impurities in the *Bismuth*, you must pour into it about twice as much *Water* and filter it; for if you should go to filter it without *Water*, it would coagulate like *salt* in the *Filter*, and not pass through. This *Coagulation* proceeds from the acid spirits of *Niter* that are included in the particles of *Bismuth*, which finding too little liquor to swim in and disperse, do gather together into *Crystals*, when the dissolution is cold.

This *Magistery* may be made by pouring in great quantity of *Fountain water* without any *salt*, into the dissolution, but it is made the quicker, when you use *salt*, and the *Precipitation* is the better because *salt* does encounter and break some of the acids that *water* alone was not able to weaken sufficiently.

Now some difficulty appears here in conceiving how plain *water* alone comes to precipitate *Bismuth*, *Lead*, *Antimony*, which the acid had dissolved, and yet can do nothing at all to the *Precipitating Gold*, *Silver*, or *Mercury*, without the assistance of some *salt* or other body; I do imagine that the former having large *Pores*, *Acids* can stick so close in them that *water* may force them out; but *Gold*, *Silver*, and *Mercury*, having finer *Pores* in comparison than the other, do retain acids so very closely that the weak impulses of *water* alone can make no
sepa-

separation; some more active body is requisite to do it.

The *Augmentation* which happens to *Bismuth* when made into a *Magistery*, does come from some part of *Spirit of Niter* that remains still in it, notwithstanding the *Precipitation* and *Lotion*.

Add to pag. 52. Chap.

Of Lead.

Lead serves to *Purifie Gold* and *Sylver*, and may be said to act in the *Coppell*, much after the same manner as the *white* of an *Egg* does in *Clarifying* a *Syrop*, that's boyled in a *Bason*; for as the gross and terrestrious impurities of a *Syrop* do stick to the *white* of an *Egg* by reason of its glutinous nature, and are driven to the sides of the *Bason* in the stirring, so do the *Heterogeneous* parts that were mixt with *Gold* and *Sylver*, stick unto the *Lead*, and by the fire are driven to the sides of the *Coppell* like unto a *Scum*.

Add to pag. 53.

Remarks upon Calcination of Lead.

There happens an observation in the *Calcination* of *Lead*, as well as several other things, which very well deserves some reflection. 'Tis that although the *Sulphurous* or *Volatile* parts of *Lead* fly away in the *Calcination*, which loss
C should

should indeed make it weigh the less, nevertheless after a long *Calcining* 'tis found, that instead of losing it increases in weight.

Some trying to explicate this *Phenomenon* do say, that as long as the violence of the flame does open and divide the parts of the *Calx* of *Lead*, the *acid* of the *Wood* or other matter that burns, does insinuate into the pores of this *Calx*, where 'tis stopt or fixt by the *Alkali*; but this reason will not hold, when 'tis considered that this *Augmentation* comes to pass as well when *Lead* is *Calcin'd* with *Coals* as *Wood*, for *Coals* contain only a fixt *Salt* that rises not at all.

'Tis better therefore to refer this effect to the *disposition* of the *pores* of *Lead* in such a manner, that part of the fire insinuating into them does there remain imbodied, and can't get forth again, whence the weight comes to be encreased.

If you would revive this *Calx* of *Lead* by way of *Fusion*, its parts do squeeze and expels the igneous particles that were inclosed, and the *Lead* does thereby weigh less than it did when reduced into a *Calx*, for by this means the *Sulphureous* parts are separated and lost.

Add to pag. 60.

Remarks upon the Burning Spirit of Saturn.

If you use six ounces of *Salt* of *Saturn* in your *Distillation*, you'll draw an Ounce and six drachms of liquor, and there will remain in the
Retort

Retort six ounces and six drachms of a blackish and yellow matter; and if you put this matter into a *Crucible*, setting it in the fire, 'twill melt, and you'l regain four ounces of *Lead*, and half an ounce, or it may be six drachms of a yellow earth coloured like *Litharge of Gold*.

'Tis evident from this Operation that an ounce and six drachms of the more Acid parts of *Vinegar* are sufficient to impregnate four ounces and two drachms of *Lead*, to reduce it into *Salt*; but the strangest thing that happens to it, is the great change that *Acids* do give it, insomuch that 'tis not to be known again in the least.

The *Augmentation* that the *Lead* in the *Retort* does here receive, is as plain as may be; for six drachms are taken out of it at last, more than were put in of *Salt of Saturn*, besides an ounce and six drachms of liquor that were drawn out. So that we must necessarily conclude, that the four ounces and two drachms of *Lead* are grown encreased two ounces and an half.

'Tis probable enough that the more rarified the *Lead* becomes, the more capable 'twill be of igneous particles; for although the *Salt of Saturn* is not suffer'd to remain long in the fire, yet the *Lead* encreases apace. Possibly it may be that as fast as the *Acids* go out of it, igneous bodies enter in their place, and open likewise the *Pores* of *Lead* by their nimble motion; but these *Pores* must needs be so disposed as to shut again like valvules, and hinder the return back of those fiery parts.

When this *Calx* is *Calcined* in an open fire in a *Crucible*, without stirring it, the parts of *Lead* close together and expel the fiery particles, so that the *Lead* *revives* as it was before, and recovers its *Natural* gravity.

The matter when shut up in the *Retort* would never be able to *revive*, let the fire be made never so strong, because the igneous particles would find no liberty to get out.

• The *Yellow earth* that's found in the *Crucible* seems to be of a Golden colour, 'tis a terrestrious and bituminous impurity that the *Lead* is separated from. There should be indeed but two drachms of it, because four ounces of *Lead* are drawn off, wherefore the *Augmentation* must needs be from the fiery parts that remained in it as in a *Calx*.

Add to pag. 61. Chap. 6. lin. 7.

Of Copper.

Because *Copper* contains in it a *Corrosive* quality, I would advise no body to use it *inwardly*.

Copper takes *Rust* very easily, for if you leave but a drop of *Water* some hours upon a piece of it, it creates a *Verdegrease*. Have a care of *drinking* water, that has lain in *Copper* vessels, for it always dissolves some portion of it, which appears easily from the taste it leaves in it.

• Twill not be altogether amiss to make mention here of an effect that is no less strange than usual. 'Tis that *Water* or any other liquor that's heated

or boil'd in a *Copper* vessel for a whole day together, savours not at all, or not so much of the *Copper*, provided 'tis not remov'd off the fire all the time, as other *Water* warm'd in a like vessel, and put from the fire but an hour; for whereas *water* alone can dissolve something of the *Copper*, it would seem that being aided with the heat of the fire, it should partake of its nature the more easily. Now in my opinion this is the most rational explication that can be given of this matter.

Every body may perceive that when the *water* begins to heat in a *Bason* or other *Copper* vessel, that's set over the fire, little *Atoms* do rise at bottom like the stirring of a powder, and these *Atoms* do encrease according as the *water* receives more *heat*, so that at length they make it boil a high; these little *Atoms* can have no other cause than the fiery particles, which passing through the *Bason*, do drive the *water* upwards apace, and rarifie its parts; for this reason 'tis that the *water* is not able to dissolve any of the *Copper*, for being continually raised upwards, it can make no impression upon the bottom of the *Bason*.

Perhaps some will tell me, the liquor might take the impression of the *Copper*, at the sides of the *Bason*; but it is easie to imagine that though there don't pass through the sides so many fiery particles as do at the bottom, there do pass nevertheless enough to hinder the liquor from sticking to or dissolving any particles of the vessel.

But now on the contrary the Basen being remov'd from off the fire, and the motion of the igneous particles being quite ceased, the liquor impregnates of the *Coppery* nature with ease, nay and so much the more easily as the fire has rarified the metal, and rendred it the more proper for dissolution.

Every thing seems to confirm this Opinion, for if any liquor is put boiling over a strong fire in a *Copper* vessel, 'twill not impregnate in the least, but if you place it upon a small fire, and leave it so for some time, then because there will not pass enough fiery particles, to cover all the surface of the vessel, and raise up the liquor, 'twill take some taste of *Copper*; but this taste will not be so strong as if you had left it the same length of time in such a vessel off the fire, after it had been warm'd.

Liquors that are full of *Salts* do take the impression of *Copper* much more easily than those that are not. Thus *Confectioners* do take notice of what I have mentioned; for though they boil their *Confections* in vessels of *Copper* for a considerable time, they find 'em taste nothing of the *Copper*, but they know that if they should leave them but half an hour in the vessel taken off the fire, they would be tainted with a most loathsom *Copper* taste.

We may learn from this Discourse, not to use a *Copper* vessel, when we have a mind to boil or heat a liquor gently, and when we do think fit to use it, to be sure to keep a good brisk fire underneath, and not to let what we have boil'd,
cool

cool afterwards in a vessel of this nature.

Another difficulty does here offer it self on this subject, and it is to know why a *Kettle* that has been taken off the fire, is not so hot at *bottom* as at the *sides*, so that assoon as 'tis removed from off the fire, one may touch it at bottom without burning ones finger, which can't be done at the sides without present scalding.

The reason of which is, that the fiery particles tending upwards through the bottom of the *kettle*, which is flat, in a direct line, don't make any stop in passing through, having but a little distance to conquer before they come into the liquor; but those that rise on the sides, finding a longer space to make upon the *kettle*, do many of them stop in the pores of the *Copper*.

'Tis not the same thing in Kettles that are made in another form, whose bottom is Globular, because the fiery particles rising up in an indirect line, do find more to do to pass it through, than in a flat bottom, and so by consequence more of them do stop in the vessel it self.

Yellow Copper is a mixture of *Lapis Calaminaris* and *Copper*, and vessels that are made of it give less impression to liquors than the others.

Add to pag. 68. lin. 6. Chap.

Of Iron.

Iron is found in many *Mines* in *Europe*, in form of a *Stone* or *Marcassite*, which much resembles the *Loadstone*, but this last is more heavy

and brittle than *Iron*. The *Loadstone* is also found in *Mines* of *Iron*, and may be reduced into *Iron* by a strong fire. *Iron* for its part does easily acquire the virtue of the *Loadstone*, as every body knows, so that these bodies do seem to differ only in the figure of their Pores, as has been very well observed by our *Modern Philosophers*.

Iron in the *stone* is melted in large Furnaces made on purpose, both to purifie it from some earth, and to bring it into the Form we desire. Having continued some time in *Fusion*, it *Vitri-fies* as it were, and much resembles an *Email* of several colours; and it enters indeed into the composition of ordinary *Emails*, with *Lead*, *Tinn*, *Antimony*, *Sand*, the *Sapphire*, the *Stone of Perigord*, (a Province in *France*) *Gravelled ashes*, and the *ashes* of a *Plant* called *Kali*. Although *Mars* does contain an *Acid Vitriolick Salt*, yet it ceases not being an *Alkali*, for it *ferments* with *Acids*; and no body needs wonder at this effect, when they consider there is more *Earth* than *Salt* in this *Metal*, and this *Earth* confining this *Salt* within it, retains *Pores* enough to receive the Points of *Acids* when thrown upon it, and so do the office of an *Alkali*; for as I have said speaking of the *Principles*, it is sufficient for a body to be called an *Alkali*, if it has its *Pores* so disposed as that the *Acids* may be able through their motion violently to divide whatsoever stands in their way.

Mars is almost always *Astringent* by *Stool*, by reason of its *Terrestrious* parts, and *Aperi-tive*

tive by *Urine*, not only by reason of its piercing *Salt*, but also because when the body is bound, the humidities do more easily filter by way of *Urine*.

Add to pag. 70. The last line of the
Remarks upon Opening Saffron of Mars.

Seeing some persons have pleased to contradict the *Remarks* I have made upon the Effects of *Mars*, and particularly concerning the preference I have given *Iron* to *Steel* for Physical uses, I have thought it not convenient to end this Chapter, before I have laid down and Answered all their Objections.

First then they say, that because the different substances of *Mars* cannot be separated, as those of *Animals* and *Vegetables* can, 'tis in vain an *Aperitive* virtue is attributed to its *Salt*.

Answer. I grant all the substances of *Mars* can't be separated so easily as those of *Animals* and *Vegetables*; but because we find *Salts* to be *Aperitive*, and commonly Remedies that are so, are full of *Salts*, and that *water* in which *Rust* of *Iron* has steeped for some time, is proper to open by way of *Urine*, it seems to me rational enough to attribute this effect of *Mars* principally to its *Salt*; for if the *water* has carried off any taste or penetrating quality from *Iron*, there's nothing at all in *Mars* that is able to contribute such a virtue to it, besides the *Salt* therein dissolved.

Secondly,

Secondly, they say, the *Earth* and *Salt* of *Mars* being united and in a manner *inseparable*, cannot act but by consent of both, and receive together joyntly the good or bad impressions, that may happen to them.

I *Answer*, there's no reason to think the *Salt* of *Mars* absolutely *inseparable* from the *Earth*, for the *water* in which this Metal has steeped or boiled, after *Filtration* does contain a *Vitriolick* taste, and *Aperitive* quality. Now 'tis the effect of *Salt* to dissolve imperceptibly in *Water* and drive by *Urine*, as I have said; but if any body would take the pains to steep and boil gently the *rust* of *Iron* a good while in *water*, then *Filter* it, and to *Evaporate* the liquor over a small fire to a *Pellicule*, he'l by *CrySTALLIZATION* or by an entire *evaporation* of the humidity, gain a small quantity of *Salt*; and 'tis probable enough there was much more in the *water*, as may be collected from the strong taste it had of *Mars*, but it being of a pretty *Volatile* nature, if fum'd away in the *Evaporation*. I do not say nevertheless that the close connexion of *Earth* with the *Salt* of *Mars* is altogether *unuseful* for this effect; on the contrary, I do conceive that this *Earth* rendring the *Salt* more heavy than otherwise it would be, does help to drive it forwards, and causes the *Mars* sometimes to penetrate as much by its gravity as by its *Salt*; but we must attribute the principal virtue to the *Vehicle* which is *Salt*, since without that, the *Earth* would be a dead matter, and would have no more action than other *Earths* bereaved of their *Salts*.

Thirdly,

Thirdly, They object, we must not think the hardness of the parts of *Steel* above *Iron*, whose Pores are more open, does render it less proper for all sorts of Preparations, seeing *Spirit of Vitriol*, and many other *Acids* are found to dissolve with the same ease both *Iron* and *Steel*.

I Answer, that if *Corrosive Spirits* do dissolve *Steel*, they can dissolve *Iron* more easily; and whereas a smaller quantity of them can operate upon *Iron* than *Steel*, a better effect does thence follow.

Fourthly, 'Tis objected that the solidity of *Steel* may be an advantageous circumstance to it, for the better fixing the dissolving Juices that are in the stomach, and that for *Metals* the pure are to be chosen before those that are not so.

I Answer, that instead of the solidity of *Steels* being helpful to the stomach, 'tis certainly of great prejudice to it, as well as to those other parts 'tis distributed into; for the juices that are found in the stomach being but weak dissolvents, are not able to penetrate nor rarifie this metal, if it is too hard; so that they leave it crude and indigest, heavy and incommodious to this part: Wherefore it passes away by Stool, without any good effect, as often happens. But now if a little of this *Steel* does happen to pass along with the *Chyle*, it rather causes than takes away Obstructions, for by insinuating into small vessels, it stops in the narrow passages, and causes grievous pains.

For what is said concerning the Purity of metals, it is of great use to Tradesmen, for they
by

by *Purifying metals* from their more rarified and *Volatile* parts, do make them the less *Porous*, and so the less liable to suffer prejudice from the Air or time. Thus *Steel* is much fitter for *Utensils* than *Iron*, because its *Pores* are closer laid together, and it takes not *rust* so soon as *Iron*; but in *Remedies* 'tis not the same thing, for those *metals* that are more *Rarified*, and are easilier dissolved in the Body, are such as we find best effects from, for the reason I have given. So that what *Workmen* call *Purity*, is often but an *impurity* in *Remedies*.

Fifthly, They say, if one would hope to find a distinct *Salt* in *Mars*, 'twould be more likely to find it in that which is *Purified*, than in the *Faces* which are separated from it, and which are indeed but the *Impurities* of *Iron*, that *Steel* is made of.

I *Answer*, there would be some reason to think that *Salt* might be more easily found in *Steel* than *Iron*, if in the making of *Steel*, *Iron* were simply *Calcined*, without adding *Nails* and *Horns* of *Animals* in the *Calcination*; for then it might be said that the *Sulphur* of *Iron* being in part evaporated, its *salt* would be the more *Soluble*: but we must consider that the *Volatile Salts* which come from these parts of *Animals*, being piercing *Alkali's*, do destroy the *Acid salts* of *Iron*, and do thereby render the *Steel* more compact, and unfit to take *rust*, because the *salts* which by their motion did rarifie the *metal*, are fixed, and as it were *mortified*, and have not the capaciay of acting as they did.

did. This is the reason why a *Plate of Steel* that has infused in *Water* will not give so great Impression to it, as a *Plate of Iron Calcined*, of the same weight, infusing the same time, will do.

Another thing remarkable in the *Calcination* of *Iron* to turn it into *Steel*, is that it is thereby deprived of its more *Volatile salt*, which should have most effect with it, in hopes to free it from *Impurities*, and that which is called the *Scories*, is the better part of *Iron* that has been rarified by its *salt*. Thus for the same reason that some are pleased to call the *rust* of *Iron* its *drofs*, the whole *metal* may deserve the same appellation, all of it being capable of *rusting*, if it is but laid in the open air.

Add to pag. 92. To the end of the

Remarks upon Reviving Cinnabar into Quicksilver.

I could attribute the invention of this discourse to my self, being the very first that thus treated of this matter in *France*, and maintained it in *publick meetings*; but I am not possessed with that vanity of *Authors*, I leave it to those that love it: I had no affectation to make a *Book on purpose* concerning it, but have only mentioned it as a thing incident to the Subject I treated of. I shall only say by the by, that those who make pretence of first finding it out, have hapned to make their complaints a little too late, having

Printed

Printed their *Book* a year after mine, and three years after I held a *Publick Discourse* of it at *Monsieur Launay's*, not to speak of what I taught a long time before in the first *Courses* of *Chymistry* that I shewed.

Those who desire to be further instructed upon this Subject may read *Monsieur Blegny's Book* Treating of *Venerreal distempers*. 'Twas Translated into *English* 3 or 4 years ago, and Printed for Mr. *Burrel* the Bookseller under *S. Dunstons Church*.

Some thinking to invalidate what I established in the first *Edition* of my *Book*, do say that *mercury* cannot be absolutely called an *alkali*, because the *alkali* that is in *mercury* is but one part of its Composition, and is not to be separated from its other parts.

To Answer this difficulty you need but only read in the *Remarks* that I have made upon the *Principles*, how it is I do explicate the nature of an *Alkali*, and you'll find that although the name *Alkali* comes from the *Salt* of a *Plant* called *Kali*, that is, *soapwort*, yet all bodies that cause a sudden *Effervescency* with *Acids* are called *Alkali's*, without any need of their containing any *Alkali salt* within. So that I have no occasion to enlarge this *Book* without reason, by Answering all the little *Objections* that have been made to me upon the supposition of *Mercury's* being a pure *Alkali*. 'Tis likely enough that those who have rais'd them, have not read with Attention what I have said in my *Remarks* upon *Mercury*. For there are *Solutions* enough. I shall speak nevertheless to some of the Principal ones.

First,

First, It is *Objected* that if *Mercury* is an *Alkali*, and the *Venercal* venom an *Acid*, this same *Acid* should certainly fix it, whereas the Dissolutions of it that are made by the *Juyces*, do only serve to encrease its *Volatility*, and render it *Corrosive*, instead of being at all sweetned by it.

I *Answer*, it is as false to say, that *Mercury* is *Volatilized* by the *Acid Juices* of the *Venercal* venom, as it is that *Mercury* mixed with *Acid Spirits* to render it *Corrosive*, should be *Volatilized* by the same *Spirits*. On the contrary, *Mercury* alone does easily *Volatilize* by the heat of the body, and nothing but *Acids* are able to fix it at all. I thought I had sufficiently explicated my self as to this when I said that sometimes *Mercury*, finding not in the body enough *Acid Spirits* to fix it, does pass by *Transpiration*.

As for the *Corrosive* nature that *Mercury* receives, we must attribute it to the *Disposition* of its *Pores*, and the abundance of *Acid* points it impregnates with, and seeing it will not sweeten the *Acidity* of *Salt* and *Vitriol*, with which it is mixed to make a *Sublimate Corrosive*, why should we expect it to sweeten the *Acid Juices* of the body? I do not pretend nevertheless that it never *Dulcifies* at all; for I do conceive it may destroy much of their force by dividing and breaking their points, when the *Acids* are but few, as does happen in *Mercurius dulcis*.

Secondly. 'Tis *Objected* that if the venom of the *Pox* were an *Acid*, it might then be Cured by the use of *Alkali Salts*, either fixt or *Volatile*,

as

as by *Crabs-Eyes*, *Perles*, *Corals*, and such like bodies as are wont to kill and sweeten *Acid* humours.

I *Answer*, we often find that *Volatile salts* do give some ease to those that are troubled with the *Venereal distemper*, whether it be by opening the *Pores*, and so making the subtler part of it perspire away, or that by being *Alkali's*, they do *absorbe* some part of it. For this reason some do use to give their Patients the *Volatile Salt of Vipers* several mornings together, but these *Alkali's* are in truth of too weak a nature to carry off such an *Acidity*, after they are impregnated with it, as *Mercury* is able to do without losing its nature. They are *Nets* of too fine a make, to catch such keen and active bodies; if these *Salts* do destroy some part of the *Acidity*, they destroy themselves likewise in the conflict, that they can have no further operation, wherefore there's need of a more powerful *Volatile Alkali* than these *Salts* are, to eradicate the *Acidity* of *Venereal Poyson*.

As for *Fixt Salts* and *Alkali* bodies, as *Perle*, *Coral*, *Crabs-eyes*, whereas they have no *Volatile* quality in them, and their tendency is wholly downwards, 'tis very uncertain whether ever they reach to *Venereal tumors* which commonly rise in the *Joints*, by reason of the long way they have to pass thither, and the *Juices* they have to encounter in their passage, which may in all likelihood change their nature; but suppose they were carried to those *Tumors* with the same qualifications they were taken with, they

they would only serve to weaken a little this *Acidity*, without being able to carry it off, and so they would only give a little ease, without removing *Radically* the *Ferment* of the Distemper, as *Mercury* is able to do.

It may be further asked why *Sublimate* does not fill the substance of the *Brain* with *Ulcers*, as well as it does the *Mouth*.

I Answer that this *Sublimate* being in the *Brain*, finds it self so clog'd with a Mucilaginous moisture, that it is fain to lose there some parts of its *Acidity*; so that it can do nothing else but cause a *Fermentation*, which makes the *Flegm* purge away through the *Salivating vessels*, and this it is that causes the *Spittle* of those who have a *Flux*, to be so sharp and stinking.

This sharp *Flegm* may also, as it passes in the *Mouth*, encrease the number of *Ulcers*, for the *mouth* is as it were the *sink* of the whole body upon this occasion.

Add to pag. 94. the beginning of the

Remarks upon Sublimate Corrosive.

Not half the *Spirit of Niter* is requisite to dissolve a pound of *Mercury*, as is for the same weight of *Bismuth*, though the *Pores* of this last are larger, and its parts more disposed for division; the reason of which is, that *Mercury* being a *Volatile*, and the parts very little united together, it divides almost of it self, and is much more easily born up by *Acids*, than would

a body that has union in its parts, and whose tendency is downwards, such as *Bismuth*.

This Operation may be done if one will, by only mixing crude *Mercury* with *Salt* and *Vitriol*, without the trouble of dissolving it with *Spirit of Niter*; but there's a great deal of time requisite to incorporate them together, for to make the *Quicksilver* quite disappear. Again there's a fume that rises up to the Nose that is very unwholsom. Now that which is aim'd at in dissolving it, and reducing it into a white Mass, is only to fit it the better for mixture.

Add to pag. 96. the end of the same

Remarks.

Those who have thought fit to Criticize upon what I have said about the effects of *Mercury*, would methinks, have spoken more to the purpose than they have done, if they had objected to me a difficulty that I have made to my self since the first *Edition* of my Book. 'Tis this, If the *Mercury* that is given in order to raise a *Flux*, does joyn with the *Acid salt* of the humors, and so makes a *Sublimate Corrosive*, after the same manner as 'tis made in the *Matrass*, when 'tis mixt with *Salt* and *Vitriol*; this *Sublimate* of the body can't be perfected, as long as there is any watry humor in the part, wherein *Mercury* is mixt with *Acids*; just as none of it can be made in a *Matrass*, until all the *Phlegm* that's in it, is evaporated away. Now it is not to be
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conceived, that there should ever happen such a Desiccation to the body, for it would be *Corroded* by *Mercury* loaded with *Acids*, before it could *Sublime*.

To answer this Objection I say, That although I have made a comparison between the *sublimation* of *mercury* that's made in the body, and that which is done in a *Matrafs*; nevertheless there is this difference between them, that the first is not only made with *Salts* extremely *Volatile*, but is likewise assisted or carried on by the motion of the humours with all their humidity up to the Head, whereas this other is made with *Fixt Salts*, whose *Acidity* is so strongly rooted in the Earthy part, that it can't be separated from it, without a very considerable fire.

Nor must we think that the *Mercury* in the body is loaded with as many and as strong *Acids*, as that in the *Matrafs*; for if it were so, it would carry destruction, and cause a *Gangrene*, wheresoever it came; but it is enough, that its *Pores* are in part impregnated with them, sufficient to diminish a little of its *Volatility*, and cause those prickings and pains which do happen during the *Salivation*.

Add to pag. 97. The

Remarks upon *Mercurius Dulcis*.

The *sweet Sublimate* that is made in a *Matrafs*, loses half an ounce each *sublimation*; so that an ounce and a half is lost in 3 times when the Operation is done.

Six drachms of *Scories* and light earth are found at bottom and consequently there is but two drachms of matter carried off each *Sublimation*. But if you would try this Operation in *Viols*, the *sublimate* would lose half an ounce more, as having a larger aperture to fly out at, than in a *Matrafs*.

Add to pag. 101. The

Remarks on White Precipitate.

The *Dose* of *White Precipitate* must be less than that of *sweet sublimate*, because it contains more *Acid Spirits*; but if you would *Sublime* this *Precipitate* all alone in a *Matrafs*, over a gentle fire, you'd obtain a *Sublimate* quite as *sweet* as the other; because the fire having acted upon it breaks most of its points, and then it may be given in as great a *Dose* as ordinary *Mercurius Dulcis*.

The *Volatile Spirit* of *Sal Armoniack* containing an *Alkali Salt*, does much help the *Precipitation*, for its agility carries it into every recess of the liquor, where the *Sea-salt*, whose parts are not of so active a nature, was not able to go: which is proved from hence, that if you make use only of *Sea-salt* dissolved in water to make this *Precipitation* with, it will then happen that if after pouring off the clear liquor, which swims upon the *Precipitate*, into another vessel, you drop the *Spirit* of *Sal Armoniack* into the liquor, there falls a considerable quantity of
Mer-

Mercurial Precipitate, which may serve like the other. If instead of the *Volatile Spirit* of *Sal Armoniack* you'd use the *Oyl of Tartar* made *per Deliquium*, the *Precipitate* would then be *Reddish*.

Add to pag. 102. The

Remarks upon Red Precipitate.

Many Authors have thought they could encrease mainly the *Redness* of this *Precipitate*, by *Cohobating* it, or distilling *Spirit of Niter* three times upon the *white mass*; but I have found by experience in both these ways of Operation that these Circumstances are to no purpose.

The *white Mass* which remains after Evaporation of the humidity is a mixture of *Mercury* with a great many *Acid Spirits*, for it weighs three ounces more than the *Mercury* did which was dissolved; it is extreme *Corrosive*, and fiery, if applied to the flesh, but according as it is *Calcined* in order to make it *Red*, the edges of the *Spirit of Niter* which caused the *Corrosion* do pass off, and fly into the Air; whence it comes to pass, that the more we desire to encrease the *Redness* in the *Calcination*, the less it weighs, and the less it corrodes. Some *Chirurgeons* observing this effect do choose the *Precipitate* that is not so *Red* as usual, when they would make a quick *Eschar*.

If you still continue the fire some hours under the *Red mass*, it will *sublime*, and still retain its

colour; this *sublimate* is not so *Corrosive* as the other; which makes me think that the points of *Spirit of Salt* are necessary to make a *sublimate* very *Corrosive*. The reason why it will *sublime*, is because the *Mercury* being discharged of a great many *Acid Spirits*, that held it *fixed*, has power to rise with those that remain. But because these remaining *Spirits* do moderate a little its *Volatility*, it makes a stop in the middle of the *Viol*.

Some do put *Red Precipitate* into an Earthen Pot, and pour upon it *Spirit of Wine* well *Rectified*, then fire it, and when the *Spirit* is consumed, they add more, and burn it as before; they repeat *Spirit of Wine*, and burn it six times together, and then they call this Preparation *Arcanum Corallinum*. The *Spirit of Wine* by burning does carry off some edges of the *Precipitate* and joyns it self to the rest, so that this *Precipitate* is sweetned and rendred fit to be taken inwardly.

If by way of curiosity you pour *Spirit of Vitriol* upon common *Red Precipitate*, such as I have described, a *Dissolution* will soon follow, because *Spirit of Vitriol* joyning with the *Spirit of Niter* that remained in the *Precipitate*, an *Aqua Fortis* must happen from their union, which is able to dissolve imperceptibly the parts of *Mercury*; but this *Dissolution* will happen without any *Ebullition*, because the *Mercury* has been already rarified by an *acid*, so that the *Spirit of Vitriol* does only dissolve them without making any commotion. The *Dissolution* is clear
like

like other Dissolutions of *Mercury*, without any manner of appearance of *Redness*, and the same Preparations may be made with it as are used to be done by the *Dissolution* of *Quicksilver* in *Aqua fortis*.

If instead of *Spirit of Vitriol* you pour *Spirit of Salt* upon the *Red Precipitate*, it turns presently into a curious *white*, because the *Spirit of salt* breaks the force of the *Spirit of Niter* that was in the *Red Precipitate*; and the same thing must happen here as when *Spirit of salt* is poured upon the *Dissolution* of *Quicksilver*; for although *Red Precipitate* is a *Dry* body, yet it is nothing else but a mixture of *Quicksilver*, and *Spirit of Niter*.

As for the sudden change of *Colour*, it is indeed somewhat strange, that a matter which is grown *Red* by *Calcination*, should in a minutes time turn so exceeding *white*.

This Effect can be attributed only to the dislocation which the *Acid Spirit* of *salt* does cause in the parts of *Red Precipitate*, and to the disposition it puts them anew into, so that their *Superficies* is put into a capacity of *Reflecting* the *Light* in a *right line* to our eyes, to give the appearance of a *white colour*; for if by means of another sort of liquor or else by fire and some *Alkali* body, the Disposition of the parts of your *Precipitate* is again changed, it will obtain some other *Colour*, or else it will return and *revive* into *Quicksilver*.

If you pour the *Volatile spirit* of *Sal Armoniack* upon *Red Precipitate*, it turns into a grey powder,

powder, but if you throw a great deal of water upon it, it becomes a *milk*, though none of the whitest. The same thing happens, when you drop *Spirit of Sal Armoniack* into the *dissolution* of *Quicksilver* made with *Spirit of Niter*; for soon after the *Effervescency* is over, a *grey* powder is seen to *Precipitate*, and if you add to it water, it becomes a *milk* of the same whiteness as the other.

Common *Red Precipitate* therefore is subject to the same alterations as the *Dissolution* of *Mercury*, the *Red* colour giving no particular impression to it; which truly is a good proof that *Colour* is no *real* thing, but wholly depends upon the *modification* of the parts.

Other Precipitates of Mercury.

Mix 7 or 8 ounces of *Sublimate Corrosive* powdered, in a glass or marble Mortar with 16 or 18 ounces of warm *water*, stir them about for half an hour, then let the liquor settle, and pour it off by *Inclination*, filter it, and divide it into 3 parts to be put into so many Viols.

Pour into one of these Viols some drops of the *Oyl of Tartar* made *per Deliquium*, there falls immediately a *Red Precipitate*.

Drop into another of these Viols some *Volatile spirit of Sal Armoniack*, and you have a *white Precipitate*.

Pour into the last of these Viols about a spoonful of *Lime-water*, you have a *Yellow-water* that is called *Phagadenick-water*, or a water for Ulcers,

cers, because it is good to cleanse and heal *Ulcers*, the *Chirurgeons* do very frequently use it, especially in *Hospitals*; if you let the liquor settle, 'twill let fall a *Yellow precipitate*.

To obtain these three *Precipitates*, you have only to pour off the water by *Inclination*, wash them, and dry them apart.

Red precipitate may be used like that I described before, but it is not so strong; 'tis the truest *Red precipitate* of any.

White precipitate has the same virtues as the other.

Yellow precipitate may be used in *Pomatus* for the Itch, half a drachm or a drachm of it is mixed with an ounce of *pomatum*.

The *Sublimate* which remains at the bottom of the Mortar, being dried may be used in *pomatus* for the Itch like *Yellow precipitate*.

Remarks.

Sublimate being *mercury* loaded with *Acids*, common *water* is able to dissolve some of it, because these *Acids* do rarifie it, and make a kind of *salt* of it; but because there are not *Acids* enough in it to dissolve all the *mercury*, the most compact part of it remains at bottom, the liquor is filtred to clear and purifie it the more, it is as clear and transparent as *Fountain water*.

If by further way of Curiosity, you should drop into the Viol of *Red precipitate*, that I now described, some *spirit of Sal Armoniack*, and would shake the liquor a little, it would present-
ly

ly turn white, and your precipitate would be white; but if instead of Spirit of Sal Armoniack, you would use spirit of Vitriol, an Ebullition would rise in it, and the Red liquor would become clear and transparent as common water.

Because the Oyl of Tartar is an Alkali salt dissolved, it breaks the edges of the Acid which held up the mercury imperceptible, and serv'd as Swimmers to it in the Water, so that this mercury having nothing left to bear it up, must needs precipitate by its own weight. The same thing happens when the Spirit of Sal Armoniack is thrown upon the other part of the Dissolution of Sublimate Corrosive. For this spirit being in like manner an Alkali, produces the same effect as the Oyl of Tartar.

But although Alkali's do all agree in this that they all break and destroy Acids, nevertheless there is always some difference in their action.

And this evidently appears in those differently coloured precipitates, for this diversity can be attributed only to this, that they having in several manners wrought upon Acids, do dispose and modifie the parts of the precipitated body, so as they may be capable of making different Refractions of Light.

These precipitates are no longer poisons, though they come from sublimate Corrosive, and there's the same reason for it as there is for the precipitations; for seeing that which gave the Corrosion was an Acid, when this Acid is destroyed by such powerful Alkali's as are the spirit of Sal Armoniack, and Oyl of Tartar, that which remains must become sweet.

When

When *spirit of Vitriol* is thrown upon the liquor of *Red precipitate*, there rises an *Ebullition*, because the *Acid* does penetrate the *Alkali salt* of the *Oyl of Tartar*, and this *Alkali* being destroyed, the *Acid* dissolves what was *precipitated* before, whence it comes that the liquor clears up, and turns into *poison* as it was before.

If you would again pour *Oyl of Tartar*, then *spirit of sal armoniack* upon it, there would happen new *Red* and *White precipitates*, which might again be dissolved, and the liquor made clear again, by adding to it *spirit of Vitriol*, but a greater quantity of *Spirit* must be used than before.

Add to Chap. 9.

Of Antimony.

Although nothing but a *Metallick* substance mixt with *Sulphur* can be perceived in the analyzing of *Antimony*; nevertheless considering its *Figure*, somewhat like that of *salt-peter*, and its *Emetick* quality, which can proceed from nothing but some *punction* of the *stomach*, there's reason to think it contains an *Acid salt*; but because the edges of this *Salt* are sheathed in a great deal of *sulphur*, it cannot exert its activity, without opening a way for it, either by *salts* which divide the *sulphur*, or by *Calcination* which carries off its grosser part. Notwithstanding it is not to be understood that the *Emetick* faculty of *Antimony* does consist in this *salt* alone;

alone ; for if it were alone, it would no more produce this Effect than other *Acid salts* do, but it is assisted by the *sulphur*, which serves for a Vehicle to exalt it towards the upper Orifice of the stomach. Thus *Antimony* may be said to *Vomit*, by reason of the *Saline sulphur* it contains.

Add to pag. 109. The

Remarks upon Common Regule of Antimony.

If by way of curiosity you would *Calcine* four ounces of *Regule of Antimony* powdered, in an Earthen cup unglazed, stirring it all the while with a *Spatule*, there will rise up a vapour for an hour and a halfs time, or thereabouts, and when the matter fumes no longer, it turns into a grey powder, that weighs two drachms and a half more than the *Regule* did at first.

This *Augmentation of quantity* is the stranger, for that the fume which ascended from it during the *Calcination*, should seem rather to have diminished its weight. It must be therefore, that a great many fiery particles have entred into it, in the room of that which fum'd away.

This *Fume* proceeds from some grosser *sulphur*, that remained in the *Regulus*, and indeed it smells strong of the *sulphur*.

Add

Add to pag. 112. to the

Remarks upon Regulus of Antimony with Mars.

After the first *Purification*, ten ounces of *Regulus*, and thirteen ounces of *scories* do remain; after the second *Purification*, nine ounces and a halfe of *Regulus* do remain; after the third, eight ounces and two drachms of *Regulus*; and after the fourth you'll have seven ounces, and fix drachms of *Regulus*.

The *Star* which appears upon the *Martial Regulus of Antimony* when it is well *Purified*, has given occasion to the *Chymists* to reason upon the matter; and the greatest part of these men being strongly perswaded of the *Planetary Influences*, and a supposed correspondence between each of the *Planets*, and the *Metal* that bears its name, they have not wanted to assert, that this same *Star* proceeded from the impression which certain little bodies flowing from the *Planet Mars* do bestow upon *Antimony* for sake of the remaining *Iron* that was mixed with it; and for this reason, they wonderfully recommend the making this Preparation upon *Tuesday* rather than another day, between 7 and 8 a clock in the morning, or else between 2 and 3 in the afternoon, provided the weather be clear and fair, thinking that day which is denominated from *Mars* to be the time that it lets fall its *Influences* most plentiful of any. They have likewise

wife conceited a thousand things of the like nature, which 'twould be too much trouble to relate here.

But all opinions of this kind have no manner of probability, for no bodies *Experience* did ever evince, that the *Metals* have any such correspondence with the *Planets*, as I have maintained elsewhere; much less can they prove that the *Influences* of the *Planets* do imprint such and such *Figures* to *Metals*, as these men do determine. It would be no hard matter for me here to shew how little reason or foundation there is in discourses of that nature, and how very weak and uncertain are the *Principles* of *Judicial Astrology*; but this would be too long a *Digression* for this place, and serve only to swell this Book with things that may be found treated of at large elsewhere, and particularly in the *Epitome* of *Gassendus* made by *Monsieur Bernier*.

My fancy therefore shall not soar so high as these mens do; and though I may seem dull and mean in their eyes, I shall not search in the *Cœlestial Bodies* for an explication of the *Star* we now contend about; seeing that I can find it out in causes near at hand. There have been who gazing too earnestly upon the *Stars* above, have not perceived the *stone* at their feet, that causes them to *stumble*.

I say then that the *Star* which appears upon the *Martial Regulus* of *Antimony*, does proceed from the *Antimony* it self; for this Mineral runs all into *Needles*; but because before it is

Pari-

Purified, it is loaded with *sulphureous* and impure parts, which make it softish, these *Needles* do not appear but confusedly. Now when it is *Purified* with *Mars*, not only a great many of the more *sulphureous* parts of *Antimony*, and such as are fittest to hinder its *Crystallization*, are carried away, but also there remains the hardest and most compact part of the *Iron*, which makes the *Antimony* firmer than it was. So that the *Purification* does serve to lay open the Natural *Crystals* of *Antimony* in form of a *star*, and the *Iron* by its hardness does expatiate these *Crystals*, from whence it comes that the *Martial Regulus* of *Antimony* is harder than the other *Regulus*.

The *Crystals* then do appear in form of a *star* in the *Martial Regulus* of *Antimony*, because they were so *Naturally* in the *Antimony* before. This *star* does not appear exactly the same in the common *Regulus* of *Antimony*, let it be *Purified* never so much, because its parts have not the same tension as those of the other.

Add to pag. 116. lin. 28. in the

Remarks upon Crocus Metallorum.

The strong *Detonation* which happens when the matter is fired, is not caused from the accension of *Salt-peter*, as people generally do imagine, for want of due reflection. I shall prove in its proper place that it can't *flame* at all, and that by its *Volatile* parts it serves instead of a *Bellows* or *Vehicle* to rarifie and exalt the *sulphurs* of *Antimony*. A

A *Liver of Antimony* is prepared with equal quantities of *Antimony*, *Niter*, and *Sea-salt decre-pitated*; and because these salts do give it a *Red* colour like unto the *Opale*, this Preparation has been called *Magnesia Opalina*; it is less *Emetick* than the other, by reason of the addition of *sea-salt*, which fixes the *saline sulphur* of *antimony*.

Several other ways of preparing the *Liver of antimony* have been invented; but I am well enough satisfied in having given you the best of all, and the easiest to prepare.

If you use ordinary *salt-peter* in this Operation, you'll obtain eight ounces and two drachms of *Liver of antimony*; but if you use *Purified salt-peter*, you'll get but six ounces and a half.

This difference of quantity proceeds from the nature of *salt-peter*, for the more *Volatile* parts this *Mineral salt* contains, the more apt it is to carry off some parts of the *antimony*. Now *Purified salt-peter* is much more *Volatile* than the common sort, wherefore the *Liver of antimony*, where it is used, is in lesser quantity.

The *Liver of antimony* that's made with common *salt-peter* is the *Redder*, and comes nearer to the colour of an *Animals Liver*, than that which is made with *Purified salt-peter*; this happens through the *fixt-salt* which is in this Preparation more than in the other; for common *salt-peter* contains much *fixt salt*, as I shall shew in its proper place; this *salt* does likewise make the matter the heavier.

As for the virtues of these *Livers of antimony*, the difference is not very great, but only that which is made with *Purified salt-peter* is a little more *Emetick* than the other. I

I cannot pass by here the false imagination of some men who think that Preparation of the *Liver of antimony*, of which half a drachm, or two scruples may be given, is much better than that whereof 3 or 4 grains perform the same effect; for there's no doubt but the taking so great a quantity of *antimony* will give an impression to the *stomach*, that a lesser quantity is not able to do. Furthermore, seeing these Preparations do commonly open the *antimony* but little, or half fix the *saline sulphurs*, it is to be feared lest some *salt* they may meet with in the *Stomach*, should open them too much, or *Volatilize* them, and so produce unhappy consequences.

Add to pag. 141. Chap. II.

Of Quick-lime.

When the *stone*, that *Quick-lime* is made of, is grown red hot in the Furnaces, the Workmen have a special care to keep up the fire at an equal height, until the *stone* is quite *Calcin'd*; for if the flame which has begun to burn among the stones, should be suffered to lessen for a while, and so the heat be check'd before the end of the work, they would never afterwards be able to make *Quick-lime* with those stones any more, though they should be at the charge of burning fifty times as much Wood as is commonly required; and this, because in that interval of heat the *Pores* of the *stone*, which were begun to be
E opened,

opened, do close and shut, and the matter sinks down in a lump to the destruction of the whole. And then again the *Flame* can't rise in it any more, for it finds none of those *interstices*, or spaces between, which were frequent before, for it to pass through. The matter therefore is rendred incapable of receiving the fire any more, because all the small cells that were useful for it, are shut up and destroyed in this confusion.

'Tis Objected, that if *igneous bodies* were they that caused the *Corrosion* of *Quick-lime*, *Tiles*, *Bricks*, and all *Stones* that are not of the nature of *Lime-stone*, and *Iron*, *Copper*, *Silver*, *Gold*, and many other bodies should be as *Caustick* as *Quick-lime*, after having endured the fire as long if not longer than it.

But this does not follow, for *Tiles*, and other *Calcined stones* have not the *Pores* disposed like those of *Quick-lime*, to retain fiery particles; and if some *metals* are found to impregnate with them during their *Calcination*, they are known to retain them so well by the solidity of their parts, that neither the heat nor moisture of the flesh are able to draw them out of the places they are fixt in, to cause a *Corrosion* upon the part. It is easie here to give you an example; for if you take the *Calx* of *Lead* that encreased its weight in the *Calcination*, as I have said before, and steep it in *water*, the *water* will not act at all upon it, and the *Calx* may be taken from the *water* in the same weight it was put in; you must melt it by fire, if you would separate the *igneous bodies*: but now as for common *Quick-*

quick-lime, a small matter of moisture is able to separate the tender parts of the *stone*, and drive out the fiery particles in abundance.

'Tis said likewise that the boiling of the water which happens when flung upon *quick-lime*, must not be imputed to fiery bodies, seeing neither *spirit of Wine*, nor *Oyl*, when thrown upon it, do heat or stir at all, although they are both of them *Inflammable* bodies, nay on the contrary they are observed to quench the heat that uses to happen to *quick-lime* when water comes to it.

I Answer that these effects do proceed from this, that *Oyl*, *spirit of wine*, and other *Sulphureous* liquors of the same nature, instead of separating the parts of *quick lime*, as *water* does, do rather hinder any separation from being made, by stopping up the Pores.

That which withdrew me from the Sentiment of those who will have all the effects of *quick-lime* derived from its *salt*, was, that I could never find any of it, though I sought after it with care enough, for some through a mistake do take a certain *Bituminous scum*, which often swims upon the *Lime-water*, for a *Salt*.

Neither can I be of the opinion of those who will needs have an *Acid* to be in *quick-lime*, which being drawn out by the water, and meeting an *Alkali*, does cause the *Effervescency* which is observed, when *water* is poured upon *quick-lime*; for although according to appearance an *acid* does enter into the Natural composition of the *stone* that *quick-lime* is made of, this *acid* has lost its nature, not only by breaking its points

in its strict union with earth at the *Petrification*, but also in the violent *Calcination* that is given to this *stone* to reduce it to a *Calx*. So that we may here say, the same thing happens to the *acid* which enters into the composition of the *stone*, as I have said did happen to the *salt of Vegetables* and other mixt bodies, which though *naturally an acid salt*, changes into an *alkali* by means of its union with earth, and the fiery particles in time of the *Calcination*; there is only this difference between them both, the *acid* of the *stone* is mixed with more *earth* than the *salt of Vegetables*.

Add to pag. 152. chap. 13.

Of the stone *Hæmatites*.

The stone *Hæmatites* is called the *Blond-stone*, either from its stopping *blond*, or from its *red colour*. It is commonly found in *iron Mines*, and it contains something of that *metal*, the best is that which is clearest, and has blackish raies. It is prepared by grinding it on a *marble* with a little *Plantain water*, it is Desiccative, and astringent; it is used for *spitting of blond*, and other *Hæmorrhagies*, the dose is from fifteen grains to two scruples, it is also used outwardly in *Unguents*.

A little *acid spirit* that partakes of the nature of *Iron* may be drawn from this *stone*, by distilling it like *Vitriol* in a *Retort*; this *spirit* is a very good *Aperitive* for all *Obstructions*, the dose is to an agreeable *acidity*. Sub-

Sublimation of the stone Hamatites.

Powder and mix together equal quantities of the *stone Hamatites* and *sal Armoniack*, put this mixture into an Earthen *Cucurbite*, or glass one luted at bottom, set a *Head* upon it, and fitting to it a small *Receiver*, and Luting well the Junc-tures, place it in a *Furnace*, over a very small fire at first, to warm the vessel, then encrease your fire by little and little, until it is very strong, continue it in this condition for some hours, or until the heat of the *head* lessens, then let the vessels cool, and unlute them; you'll find in the *head*, and at top of the *Cucurbite*, *Yellow Flowers* drawing towards *Red*, and in the *Re-ceiver* a *Volatile, Urinous, Yellowish spirit*; keep the *spirit*, and the *Flowers* apart in bottles well stoppt. They are both of them very good to procure *Sweat*, and to open *Obstructions*: they may be used in *Malignant Feavers, Apoplexies, Palsies*, and in the *Scurvy*, in *Bolus*, or in proper liquors; the *dose* of the *Flowers* is from six grains to four and twenty, and of the *Vola-tile spirit*, from twelve drops to two scruples.

In the bottom of the *Cucurbite* is found a *mass* that may be distilled in a *Retort* with a gradual fire encreased to the highest degree of all, in a *Reverberatory Furnace*, there will come forth an *acid spirit* of much the same virtues as the *sixt spirit* of *Sal Armoniack*, of which I shall speak hereafter.

Remarks.

Sal Armoniack is here mixt that the *Volatile* parts may carry off the more soluble portion of the *stone Hamatites*; for it would never be able to *sublime*, if it were not driven by some such like Vehicle. This *salt* being also incorporated with it serves very much to give it the *sudorifick* quality, by reason of its *Volatility*.

The *Cucurbite* is set in an open fire, that it may be heated the more, and the *Flowers* be the more tinctur'd; for the more heat there is, the *sal armoniack* does the more easily *sublime* the parts of the *stone*; the *Volatile spirit* is only some portion of the *Flowers* drawn into liquor.

The *mass* that remains in the *Cucurbite* is a mixture of the more *fixt* part of the *stone*, and *sal armoniack*.

All that is drawn from the *stone Hamatites* is accounted of some use, and chiefly so by reason of the *Iron* it contains.

Many other *Preparations* of this *stone* have been invented, but these are the best, and choicest.

Add to pag. 154.

Remarks upon the Oyl of Bricks.

The ancient *Chymists* called this *Oyl*, the *Oyl of Philosophers*, and have given the Epithete *Philosophical* to all *Preparations* that are made with *Bricks*. The reason that can be given for it is, that

that because they call themselves the only *True Philosophers*, or *Philosophers* by way of excellence, they thought they were obliged to confer some influences of this mighty name upon *Bricks*, because they are the *materials* wherewith they build their *Furnaces*, to work at the *High and mighty Operation*, or the *Philosophers stone*; for they pretend it is by this *Operation* alone that *True Philosophy* can be obtained.

Add to pag. 165. chap. 14.

Of Common Salt.

Sea salt is made at *Rochell* in *salt marshes*, which are places that must be of a lower situation than the *sea*, and the ground must be *Clayie*, for otherwise they would not be able to retain the *salt-water* that has been let into them. Thus all places near the *sea* are not alike proper to make *salt marshes*.

When the Season of the year begins to grow hot, which commonly happens in *May*, all the water is emptied that was put into the *marshes* for better preserving them during the Winter, then the *sluces* are opened to let in as much *salt-water* as they think fit, 'tis made to pass through a great many *Channels*, wherein it *purifies* and *heats*, and then is let into places that are made flat, smooth and fit to *CrySTALLIZE* the *salt*.

This *salt* is made only during the great *heats* of *Summer*, the *Sun* does in the first place evaporate some part of the *Water*, and because after the great

heat, a small *Wind* does use to blow (as is usual near the *sea*) the *coolness* of this *Wind* does condense and *Crystallize* the *salt*.

But if it happens to *rain* but two hours during the hot weather, there can no *salt* be made for a fortnight afterwards, because the *marshes* must be again emptied of all the *water*, to let in more in its place, so that if it chances to *rain* but once again in the next fortnight, they can make no *salt*.

Besides the *Purification* of *salt* by *evaporation*, it may be further *purified*, if instead of *Evaporation* of the humidity, you set some of it a *Crystallizing* in a cool place, for very fine pure *salt* is found at bottom of the vessel, which *salt* may be separated from the water, and dried, you may then evaporate again some part of the *salt* liquor, and set it in a Celler a *Crystallizing*, and so continue your *Evaporations* and *Crystallizations*, but at last you must be fain to evaporate the liquor to the consumption of all the humidity, because at last it will *Crystallize* no longer, the reason whereof is, that the remaining *salt* is full of a fat bituminous matter, which is in a manner inseparable from it, and this 'tis that hinders the *Crystallizing* at last.

'Tis probable that this fat matter comes from the earth of those *marshes* that were spoken of.

The first *Crystallized salt* being put into *Oyl* of *Tartar*, or some other *Alkali salt* dissolved, does mix with it without making any *Ebullition*, because although *sea-salt* is *Acid*, yet its points are too gross, and have too little motion, to separate the parts of the *Alkali*. The

The last salt being dried over the fire, and mixed with some *Alkali salt rendered liquid*, such as *Oyl of Tartar*, makes a *Coagulation* and *Precipitation* of a substance that appears *saline* and *Oily*; this *Coagulation* does proceed from the mixture and adhesion of *Bituminous earth* with *sea-salt* and *Tartar*; for these salts do easily embrace *Oily* substances, and in them lose their activity.

Many *Acid Bituminous salts* which are drawn by the *Evaporation* of certain *Mineral waters*, such as those of *Baleruc* in *Languedoc*, and *Digne* in *Provence*, do perform the same effects, when they are mixed with *Oyl of Tartar*.

This *Coagulum* does not dissolve in water, as well by reason of the different nature of the salts it is compounded of, as the *Oily* earth that holds them together; but it will dissolve in *distilled Vinegar*, and several other *Acid liquors*, and then an *Effervescency* rises, because the *Acid* does penetrate the salt of *Tartar*, whose parts *sea-salt* had no power to separate.

Add to pag. 169. lin. 30.

Remarks upon Spirit of Salt.

Since I writ of *Monsieur Seignett's* particular way of drawing *spirit of salt*, some have Printed, that if common salt well *decrepitated*, and kept a good while over the fire, were exposed to the *Air* for some daies, and *distilled* without addition of any thing to it, it would yield a *spirit*
much

much like that I have spoken of, and in full as great a quantity.

But if we examine the sharp liquor which is drawn this way, we shall find it of so weak a nature, that it may more reasonably be called *Phlegm*, than *spirit*, and the salt remains entire in the *Retort*; whereas *M. Seignett's spirit of salt* is full as strong as common *spirit of salt*, & has the very same qualities, nay I conceive it somewhat better, as not having so great an *Impression* from fire as the other.

Again some say, it does not deserve the name of *spirit of sea-salt*, nor ought this *Preparation* to be look'd upon as any great *mystery*, because the same incorporation and augmentation happens to divers other *salts* exposed to the *Air*, after drawing off their *spirit*.

I grant this *augmentation* proceeds from the *spirit* of the *air*, and I conceive it is the same *spirit* which produces all manner of things according to the *Matrixes* or different pores of the earth it uses to meet with, as I have explicated in my *Remarks* upon the *Principles*. But because this *spirit* of the *air* has met with *Pores* in our matter, ready disposed to make a *salt* much like unto common *salt*, and a *spirit* is drawn from it much like unto that which is drawn from common *salt*, I see no reason to doubt why this *spirit* should not be a true *spirit of salt*; all the difference is this, the *salt* I now speak of is not so thoroughly united to its earthy part, as common *salt* is, and therefore its *spirits* do separate with more ease; for they are drawn without *Addition* of any thing else, and with a gentle fire,

fire, whereas those of common *salt* are so fixt, that they can't be driven out, without mixing a great deal of *earth* in order to separate all its parts, and without a very great fire.

As for the *Augmentation* which happens to many other bodies exposed to the Air, after their *spirits* are drawn off, I don't question the matter of fact, nor that these same substances do return into what they were before, by impregnating again with *spirits* of the Air in considerable time; but it is rarely found that any of them do yield as strong *spirits*, and as easily as our *salt*, and herein lies the *mystery*.

Add to pag. 170. lin. 12. in the same

Remarks.

Some have written, that the *Precipitation*, which is made by *spirit of salt*, of any matter held up by *Aqua fortis*, must not be imputed to the gravity, nor force of *spirit of salt*, nor to any conflict or jogg that this *spirit* gives to *Aqua fortis*, or the matters dissolved; but rather to the conjunction of the *Acidity* of this *spirit* with the *Volatile* and *Sulphureous Alkali* of *Aqua fortis*, or *spirit of Niter*, which *Acid* hereby forces this last to abandon the *metal* it had dissolved.

But this is the same as to explicate an *obscure* matter by another more *obscure*; for what likelihood is there that the *Volatile spirit* of *Aqua fortis* is an *alkali*? and how comes it to continue in so great a motion with the fixt *Acid spirit* of this
this

this *water* without being destroyed? this can't easily be understood. Again, suppose this *spirit* were an *alkali*, we must come to explicate mechanically, by what reason this *Alkali* does leave the body of the *metal* to betake it self unto the *spirit of salt*; for to say simply that by the conjunction of these two *spirits*, the *Aqua fortis* is compelled to abandon the *metal* it held dissolved, does give no light at all to the question, unless we had power enough to bestow intelligence upon these *spirits*; wherefore we must needs at last have recourse to jogs and conflicts.

Add to pag. 171. lin. 16. Chap. 15.

Of Niter or Salt-peter.

The great and violent *flame* which happens as soon as *Salt-peter* is flung upon the *Coals*, and the *red vapours* which it uses to yield when reduced into a *spirit*, have induced the *Chymists* generally to believe that this *salt* is *inflammable*, and consequently full loaded with *Sulphur*, because *sulphur* is the only *Principle* that *flames*; but if they had suspended their judgments herein, until they had got more experience on this Subject, they would not only have known that *Salt-peter* is not at all *Inflammable* by nature, but they would e'en have doubted whether or no any *sulphur* does enter into the *natural composition* of this *salt*; for if *Salt-peter* were *Inflammable* of it self like *sulphur*, it would *burn* in places where there is no *sulphur*, for example in a *Crucible*

ble heated red-hot in the fire; but it will never flame therein, use what quantity of it you please, and let the fire be never so great. It is true indeed, if you throw *Salt-peter* upon *kindled coals*, it makes a great flame, but this is only through the *Sulphureous Fuliginosities* of the coals, which are violently raised and rarified by the *Volatile* nature of *Niter*, as I shall prove in the Operation upon *fixt Niter*.

As for any *sulphur* that is thought to be contained in *Salt-peter*, it can't be demonstrated by any Operation whatever, for the *red vapours* that come from it are no more *Inflammable* than the *Niter*, when they are not mixt with some *Sulphureous* matter; and it is far more probable, that this *salt* contains no *Sulphur*, if we consider its cleanness, transparency, acidity, and cooling quality, which have no manner of affinity with the effects of *Sulphur*, which are commonly to make a body *opace*, to joyn with its acidity, and to heat it.

Add to pag. 177. l. 26.

Remarks upon *Sal Polychrestum*.

Sal Polychrestum must by no means be used until it is made very *white*, and very *pure*; for when there remains any gross portion of *Sulphur*, *Vertigoes* are to be feared, and *stapefaction* of the *Nerves*, and *nauseousness* of the *stomach*.

IF

If you used sixteen ounces of *purified Salt-peter*, and so much *sulphur* in this Operation, you'll have at last but three ounces and a half of *Sal Polychrestum* very fine; but if you use *common Salt-peter* instead of *purified*, you'll have five ounces of *Polychrestum* as *white* as the other.

This difference of weight proceeds from *common Salt-peters* containing more *fixt salt* than *purified salt-peter*.

Sal Polychrestum may be *Crystallized* like *salt-peter* and other *salts*. Its *Crystals* are very small, and much like those of *sea-salt*, but only they are keener.

Add to pag. 179.

Remarks on Salt of Sulphur.

Some have presumed to write, that when *spirit of sulphur* is poured upon *Sal Polychrestum* dissolved in Water, there rises an *Effervescency* as great as when the same *Acid spirit* is cast upon *salt-peter*; but doubtless they took but little care in what they maintained, for there happens no manner of *Effervescency*, neither with *Sal polychrestum*, nor with *salt-peter*, for both of them are *Acid salts*. Nor do I see any reason to believe, that if the mixture of *salt-peter* and *spirit of Sulphur* is drawn in a Retort, the *spirit of Niter* will come forth and leave the *spirit of Sulphur* in union with the *fixt part* of *salt-peter*; for although *red vapours* are seen to come forth of the Retort, this does not prove that

that they are purely *Nitrous*, those of the *spirit of Sulphur* are mixt with them, but they are hid in the *redness* like Water in Wine.

Add to pag. 182. after Spirit of Niter.

Spirit of Niter Dulcified.

Put into a large *Boulthead* eight ounces of good *spirit of Niter*, and so much *spirit of Wine* well *dephlegmated*; set your *Boulthead* in the Chimney upon a Round of Straw, the liquor will grow hot without coming near the fire, and half an hour or an hour afterwards, it will boil very much; have a care of the *red vapours* that come out apace at the neck of the *Boulthead*, and when the *Ebullition* is over, you'll find your liquor clear at bottom, and to have lost half what it was; pour it into a *Viol* and keep it, this is the *sweet spirit of Niter*.

It is good for the *Wind Cholick* and the *Nephritick*, for *Hysterical* distempers, and for all *Obstructions*; its Dose is from four to eight drops in Broth or some other convenient liquor.

Remarks.

You must leave the *Boulthead* open; for the *Vapours* would either carry away the *Stopple*, if there were one, or else they would break the vessel; the *Boulthead* is so hot during the *Ebullition*, that one can't endure ones hand upon't.

The

The *Heat* and *Ebullition* begin sooner or later, according as the *Spirits* that are used have been more or less *dephlegmated*.

This *Effect* is very strange, for *spirit of Niter* being a strong *Acid*, and *Spirit of Wine* a *sulphur*, it can't be said that there's here any *alkali*, to cause the *Ebullition* with *Acid*, according to the common maxime. And this *Operation* shews us that every thing can't be explicated by the sole *Principles* of *Acid* and *alkali*, as some do pretend.

This *Operation* has much resemblance with that which happens when *Oyl of Turpentine* is put into a bottle with *Oyl of Vitriol*; for the mixture of these liquors does *heat* and *boil* much alike. I shall say something of this last mixture hereafter. There is this difference notwithstanding, that *spirit of Niter* being more *Volatile* than *Oyl of Vitriol*, causes a greater *Effervescency*.

In order therefore to explicate this *Ebullition*, two things must be considered. First, that *spirit of Niter* contains a great many fiery parts lock't up in its *Acidity*, but which still retain some motion, for 'tis they that make *spirit of Niter* to *Fume* as it does.

The second is, that *spirit of Niter* is more *Inflammable* than *salt-peter*, when mixed with any *sulphureous* body, and the reason thereof is, that it is more *rarified* than *salt-peter*.

Thus when this *Acid spirit* is mixt with *spirit of Wine*, which is a *sulphur* very much *exalted*, and very susceptible of motion, the *Volatile* part
of

of the *spirit of Niter* joyns its self to this *sulphur*, and the mixture becomes ready to take *flame*; likewise after this mixture the fiery bodies that were in *Spirit of Niter*, do by striving to mount upwards put the liquor into so great a motion, that it e'en almost *flames*, and would without all question quite *flame*, if there were not some *Phlegm* always mixed with these *spirits*, let 'em be drawn never so *pure*, which serves to allay the activity of the fiery particles; so that there must needs follow a very great *Ebullition*.

This *Effervescency* therefore proceeds from this, that *spirit of wine*, and *spirit of Niter*, which are as it were a *salt-peter*, and highly *exalted sulphur*, have been almost kindled into a *flame* by the fiery bodies that were in *spirit of Niter*; and that which further proves this conception is, a *noise* or kind of *Detonation*, during the *Effervescency*, which is much like that which happens, when *sulphur* and *salt-peter* are burnt together.

The great *diminution* of the liquor proceeds from the *Evaporation* of the more *Volatile* parts of the *Spirits of wine* and *Niter*, through the neck of the *Boulthead* during the *Ebullition*.

That which remains is a well *sweetned spirit of Niter*, for not only its points are soundly blunted in the *Ebullition*, but the *spirit of wine* being a *sulphur* unites and imbodyes with those that remain, so that they have no longer any *Corrosive* quality.

Add to pag. 182.

Remarks upon *Aqua Fortis*.

The mixture of *Vitriol* and *salt-peter* has quickly some smell of *Aqua fortis*, because *Vitriol* contains a great deal of *sulphur*, which easily insinuates into the *Volatile* part of *salt-peter*, and exalts some little of it, which causes the smell; it is this *sulphur* in *Vitriol* which by volatilizing the *Red Spirit of Niter*, makes it come forth faster, and with a less fire, than when *salt-peter* is distilled with *Clay*.

Add to pag. 184.

Remarks upon the Fixation of *Salt-peter* into an *Alkali Salt*.

The *Crucible* must be but half full of *salt-peter*, because the *Detonation* is so great, that the matter would be driven out of the *Crucible*, if too much be put in. When the *Crucible* is not very strong, it breaks in pieces about the middle of the Operation, and some part of the matter is lost by it.

This *Detonation* is more violent than that which is made with a mixture of *salt-peter* and common *sulphur*, because the *sulphur* of *Coals* is more *Rarified* than common *sulphur*.

Niter will never be able to flame, when set over the fire alone in a *Crucible*, though you make your fire never so strong, and *coals* though loaded

loaded with *fuliginous* or *Oily* parts, do send forth but only a *small blew flame*; but when these two bodies come to be mixt together, the *Volatile* parts of *Niter* joyning with the *Coals*, which are *Oily*, do rarify and exalt the *Coals* with such a violence, that they produce a very great flame. Now this Operation confirms my Opinion that *salt-peter* does only serve here to *Rarifie* the flame of *sulphur*, but cannot send forth the least flame of its self; seeing that as soon as ever the *coals*, you put into the *Crucible*, are burnt, the flame goes out, and appears no more until you throw in more *Coals*, with which a convenient proportion of the *Volatile* parts of *salt-peter*, that still remained, does joyn, and *Rarifie* them into a flame. Thus new *Coals* are successively thrown into the *Crucible*, until it flames no longer; but toward the end of the Operation, because there remain but few *Volatile* parts of *Niter*, the *Detonation* is much the less, and so is the flame, until at last the *Coals* finding nothing more in *salt-peter* for it to raise, do burn only just as they use to do all alone.

If you make use of common *salt-peter* for this Operation, you'll have occasion to use but three ounces and a half of *Coals*, and you'll get twelve ounces of *Purified salt*, but if you use *fine salt-peter*, you must spend seven ounces of *Coals*, and will get but three ounces of *purified salt*.

This difference of weight proceeds from the *fine salt-peters* containing more *Volatile* parts than the other; likewise a great deal more *Coals* is required to raise them, and there remains the less *fixt salt* for the same reason.

The *fixt Niter* being prepared as I have shew-
ed, it is a little grey colour'd; now to make it
white you must *Calcine* it in a great fire, stirring
it in the *Crucible* all the while with a *spatule*;
when it shall have continued *Red hot* for above an
hour, it will become exceeding *white*. You must
then *dissolve* it in water, *filter* the dissolution,
and *evaporate* the water, and thus you have a
very pure and *white salt*.

This *salt* is an *Alkali*, being a mixture of the
salt of Coals, which is an *Alkali*, and *fixt salt-*
peter; these two *salts* are so strictly united and
mixed together in the *Calcination*, that they make
a *Porous salt*, and such as is much like unto the
fixt salt of Plants.

Not that there is an *Alkali salt* in *salt-peter*,
as *Chymists* will have it; for give what *Calcina-*
tion, or other *Preparation* you please to this
Mineral salt, without adding any thing to it,
not the least *Alkali* can be drawn from it, and all
that ever we can see in it is *Acid*.

It is further *Observable*, that the *liquor* of
fixt Niter, which has been made with common
salt peter, being kept a year, or a year and a
half, loses most of its activity as an *Alkali*, so
that it is no longer able to cause any such *Ebulli-*
tion with *Acids*, as it could before it was so
fale.

This accident can have no other cause, than that
the *Pores* of *salt* contained in the *liquor* do close
up by little and little, and the *Acid salt of Ni-*
ter does absorbe and destroy the *Alkali*, which
kept the *Pores* open.

But

But the same thing does not happen, where the *liquor of fixt Niter* was made with *Purified salt-peter*, because whereas a great deal of *Coals* was used in the *fixing* it, and but little *salt of Niter* remained in it, the *Alkali* must there predominate so powerfully, that the *Acid* is not able to regain its strength.

This *Experiment* seems plainly to demonstrate, that *fixt Niter* is only an *Acid salt* rendred *Porous* by the *Alkali* of *Coals*.

Some *Chymists* have thought fit to call the *liquor of fixt Niter*, *Alkahest*, that is, an *Universal dissolvent*, thinking it is capable to draw out the *sulphureous* substance of all *mixt* bodies.

Add to pag. 185. Chap. 16.

Of *Sal Armoniack*.

The *Artificial sal Armoniack* is made at *Venice*, and divers other places with five parts of *Urine*, one part of *sea-salt*, and half a part of *Chimney soot*; these three are boiled together, and reduced into a *Mass*, which being put into *subliming Pots*, over a gradual fire, it *sublimes* into a *salt* in the form we commonly see *sal Armoniack*. Now in this *sublimation* the *Volatile Alkali salts* of *Soot* and *Urine* do carry up as much *sea-salt* as they are able, and do joyn so strictly together with this *Acid salt*, that the mixture seems to be *fixt*. The reason of this close union is, that *sea-salt* being in form of points, does insinuate into the *Alkali salts*; and

because it has not motion enough to separate the parts of these *salts*, it gets within 'em, and fills their *Pores*.

Add to pag. 190. the end of the

Remarks upon Aqua Regalis.

It is *Objected*, that if there is any heavy matter as it were intercepted between the *Pores* of *Gold*, it must needs *Precipitate* of its self, after the action of *Aqua Regalis* upon this *metal*, which is a thing that does not happen.

I *Answer* that if the parts of *Gold* are heavy, the *Dissolvent* is a gross body, and very well proportioned to hold up those heavy parts, and hinder them from *Precipitating*.

Others have opposed this *Explication*, and have writ, that if *Aqua Regalis* dissolves *Gold*, and can't dissolve *Sylver*, the reason of it is, that the gross points of *Spirit of Niter*, or *Aqua fortis* are subtilized by the mixture of *sal Armoniack*, and are rendred fit to enter into the small pores of *Gold*, whereas the delicate *Fabrick* of these same points does not leave the necessary force nor motion to divide the parts of *Sylver*, whose pores are a great deal bigger.

But this way of arguing does not agree with *Experience*; for what likelihood is there that the points of *Spirit of Niter* are so subtilized by the penetration and division of the parts of *sal Armoniack*? or where shall we find any *Example*, that after a considerable *Effervescency* of

two *salts* met together in conflict, the *Acidity* grows sharper than it was before? this is a thing that can never be proved. On the contrary, every body knows well enough that no *Effervescency* happens but the *acid* is partly blunted or broken thereby. Moreover the Argument supposes that *spirit of Niter* does break its subtilest points in violently contending with the *sal Armoniack*, whereas in *sal armoniack* there are *Alkali salts* whose property it is to destroy *acids*. I could further add here, that the conjunction of *salt* with *spirit of Niter* should of necessity render its points more gross than they were, and that the *Crystals* which are drawn by the use of *aqua Regalis* have their shape not so sharp as those that are drawn by *aqua Fortis*. But that which I have said is so probable in its self, and so easie to be convinced of, if one takes never so little pains to consider it, that I should but amuse the Reader to little purpose, if I should offer to give any more proofs of it.

Neither do I find it convenient to make a long discourse in Explicating how *Sylver*, which has lesser Pores, is more susceptible of the impressions of Air and Fire, than *Gold* which has larger, seeing I have already supposed that the matter intercepted between the Pores of *Gold* is more compact, and consequently more hard to separate than that of *Sylver*.

Add to pag. 194.

Remarks upon another Preparation of the Volatile Spirit of Sal Armoniack, together with its Flowers, and Fixt Salt against Feavers.

You see by this Operation that eight ounces of *Sal armoniack* do contain at least four ounces and a half of *Volatile salt*.

The *Volatile Spirit* of *Sal armoniack* is only a dissolution of *Volatile salt* in *water*, and if there is not *Phlegm* sufficient to dissolve all the *Volatile salt*, there remains some part of it at bottom of the *Receiver*, and that may likewise be turn'd into *Spirit*, by only adding enough *water* to dissolve it. Thus the *Spirit* becomes as strong as it can be made, for the *Pores* of the *water* being filled with as much *salt* as they can contain, it can receive no more. But if there happens more *water* than the proportion of *Volatile salt* requires, then the *Spirit* proves weak, and must be given in a larger Dose.

This *Spirit* is *Sudorifick*, but you may perceive more sensibly the effect of *Sal armoniack* to cause *Sweat*, by dissolving six or eight grains of this *Salt*, and the same quantity of *Salt of Tartar*, each separately in two small Doses of some proper liquor, and giving them to a Patient one presently after the other; for the *salt of Tartar* working upon the *Sal armoniack* in the stomach,

mach, after the same manner as it does when they are mixt together in a *Mortar*, the *Spirits* do separate from the latter with more force, and act more powerfully, than when they have been separated, before they were given, by a preceeding mixture; for the small violence that the *Volatile Spirits* do use in their separation from *sea-salt*, does leave them the more activity, and disposes them the better to pass through the *Pores*. Again, it is not incredible, that in the former Effort which these *Spirits* made in their separation from the *fixt* part, when *Sal armoniack* was mixt with *salt of Tartar* in a *Mortar*, the more *subtle* part flies away first, and is lost; now 'tis this *subtle* portion that is most proper to *Rarifie* the humours, and to drive them out by *Transpiration*.

If you mix in a *Viole* equal quantities of *Volatile spirit* of *Sal armoniack*, and *Spirit of Wine*, and shake them a little together, they'l cause a *Coagulum*.

This *Coagulation* proceeds from that the *Spirit of Wine*, which is a *Rarified Oyl*, does unite with the *Spirit of Sal armoniack* which is a *salt liquor*, and 'tis but the same thing as happens from stirring *Oyl* and some *salt liquor* in a *Mortar*, in order to make an *Unguent*, called *Nutritum*.

By this incorporation together, the *salt* is shut up in the ramous parts of the *sulphur*, and these same *sulphureous* parts are checkt, or as it were *fixed* by the *salt*, so that neither of them have any more freedom of motion; and from this repose of these parts results the *Coagulum*.

Add

Add to pag. 197. Chap.

Of Vitriol.

If you dissolve a little *white*, or *green Vitriol* in water, and *write* with the *Dissolution*, the *writing* will not be seen, but if you rub the Paper with a little Cotton dipt in the *Decoction* of *Galls*, it will appear legible; then if you wet a little more Cotton in *Spirit of Vitriol*, and pass it gently over the Paper, the *Ink* will *disappear* again; and yet at last if you rub the place with a little more Cotton dipt in *Oyl of Tartar* made *per Deliquium*, it will again appear legible, but of a Yellowish colour.

The reason that I can give for these Effects is this, the *Spirit of Vitriol* dissolves a certain *Coagulum* which is made of *Vitriol* and *Galls*, but the *Oyl of Tartar* breaking the force of this *Acid Spirit*, the *Coagulum* resumes it self, and appears again, but because it now contains *Oyl of Tartar* too, it acquires a new colour.

If you should throw the dissolution of *Vitriol*, or *Vitriol* only powder'd into a strong *Decoction* of *dried Roses*, it will turn as black as common *Ink*; if you pour some drops of *spirit of Vitriol* into it, this *Ink* will turn *red*; and if you add to it a little *Volatile spirit of Sal Armoniack*, 'twill turn *grey*.

These changes of colour do proceed from the *spirit of Vitriols* dissolving the *Coagulum* which the *Vitriol* it self had made, and rendring it

invi-

invisible; the liquor recovers a fresher *Red* colour than it had, before the *Vitriol* was put into it, because the same *Spirit* does separate the parts of the *Rose* which were dissolved in the liquor, and renders them more *Visible*.

The *Volatile spirit of Sal Armoniack*, which is an *Alkali*, does partly break the *Acid* edges of the *spirit of Vitriol*, so that the parts of the *Rose* having nothing more to hold them *Rarified*, do close together, and consequently the liquor changes colour.

By this *Experiment* may be seen, that the *dried Rose* may serve to make *Ink* with, as well as *Galls*; *Indian Wood*, and divers other things will do the same.

Add to pag. 199. the end of the

Remarks upon Calcination of Vitriol.

If one should resolve to dry as exactly as one can, sixteen pounds of *green Vitriol*, there would remain but seven pounds of *white Vitriol*.

But in order to do this exactly, you must powder the *white Mass* of *Calcined Vitriol*, after you have broke the *Pot*, and stir it for a long time in an *Earthen Pan*, over a little fire, until there rises no more *Fume* from it, or until there remains in it no more *Pblegm*.

If you should *Calcine* this *white Vitriol* to a *Redness*, you'd have five pounds and a half of *Cholcothar*.

Some

Some have affirmed in writing that the *Red colour* which appears after a long *Calcination* of *English Vitriol*, was an undoubted proof that that there was *Copper* in it, after the same manner as the *Red colour* which happens to *Verdigrease calcined* is a certain proof that it contains in it some particles of *Copper*.

But that which is here said to pass for a thing undeniable, is no proof at all; for first of all those *Vitriols* which are thought most to partake of *Copper*, do give no greater *Redness* in their *Calcination*, than the others which partake least of it. Secondly let *Copper* be *Prepared* which way you please, you can never make it *Redder* than the *Cholcothar* of *English Vitriol*, whose *Redness* must be thought to proceed from some particles of this *Metal* contained in it. And thirdly, we see plainly, that *Iron*, *Lead*, *Mercury*, and divers *Mineral* bodies do acquire a *Red colour* in their *Calcining*, without granting they contain any *Copper*.

Add to pag. 201. the bottom of the Page,

Remarks upon Spirit of Vitriol.

If you Distil eight pounds of *white Vitriol*, at sixteen ounces to the pound, you'll draw off seventeen ounces of *Phlegm*, and two and twenty ounces and a half, both of the *Sulphureous*, and the *Acid spirit of Vitriol*. Of these two and twenty ounces and a half, there will be five ounces of *Sulphureous spirit*.

You'l

You'll find in the *Retort* five pounds, five ounces of *Cholcothar*.

Use all the care you can possible to preserve all the liquors which come from *Vitriol*, and yet it will be impossible for you to hinder it from losing some through the *functures*, during the *Distillation*.

If you should use *German* instead of *English* *Vitriol*, you'd draw off a little more *spirit* than the quantity I named, but it would have some smell of *Aqua Fortis*, and the matter which remains in the *Retort* would be of a *brown* colour drawing towards *black*. This Colour proceeds from *sulphureous Fuliginosities* which rise more from this *Vitriol* than the other, because it partakes of *Copper*; for this Sooty vapour finding no vent to get out at, falls down again upon the matter and blackens it.

There's one thing happens about the *Oyl of Vitriol*, when 'tis very strong, which is very strange indeed; it is, that if you mix it with its *Acid Spirit*, or with *water*, or else with an *Ethereal Oyl*, such as the *Oyl of Turpentine*, this mixture grows *hot* to that degree, that sometimes it breaks the *Viol* 'twas put into, and often it produces a considerable *Ebullition*.

I should quickly give account of this *heat* and *Ebullition*, if I would suppose an *Alkali* in the *Oyl of Vitriol*, as those do who pretend to explicate every thing that happens by the notions of *Acid* and *Alkali*; but not comprehending how an *Alkali* should be able to remain so long a time with so strong an *Acid* as is the *Oyl of Vitriol*

triol without being destroyed, I had rather give a reason that seems to me abundance more probable.

I conceive therefore that if *water*, or *Spirit of Vitriol*, or the *Ethereal Oyl of Turpentine* do heat the *Oyl of Vitriol*, it is by setting in motion a great many fiery particles which the *Oyl of Vitriol* had drawn with it in the *Distillation*; for these little fiery bodies being environ'd with salts that are exceeding heavy, and hard to *Rarifie*, they drive about vehemently whatsoever stands in their way, and when they have caused an *Ebullition*, and find they can't get out a-top of the *Viol*, they break it to pieces with the bustle they make at bottom, and on the sides.

Perhaps it will be said, I do here suppose *gratis* that the *Oyl of Vitriol* does contain fiery particles; but if we consider the great violence of fire, and the time that is spent in drawing this *Acid*, 'twill be no such hard matter to grant me this supposition. Besides it will be hard to explicate the great and burning *Corrosion* of *Oyl of Vitriol* without admitting these fiery parts, for the *Vitriol* contains nothing in it self of this *Caustick* nature; 'tis true indeed that it contains *Phlegm*, *Sulphur*, and *Earth*, but it is a thing impossible but this *Acid* should discover it self more than it does, if it were as *Corrosive* in the *Vitriol*, as it is in the *Oyl*.

Once it hapned to me, that putting into my *Furnace a Retort* whose two thirds were filled with *German Vitriol* dried, in order to draw off its *Spirits*, I *Distilled* first of all the *Phlegm*,
and

and *sulphureous spirit*, which I took out of the *Receiver*; I then fitted it again to the *Retort*, and by a great fire continued for three dayes and three nights, I *distilled* off the *Acid Spirit* as we are used to do. When the *Vessels* were grown cold, I admired to find in my *Receiver* nothing but a *Mass* of *Salt*, or *Congel'd Oyl of Vitriol*. This *Salt* was so exceeding *Canstick* and burning, that if I offer'd to touch the smallest part of it with my finger, I presently felt an insufferable *scalding*, and was fain to put my hand immediately into *water*, it continued to fume still, and when a little of it was thrown into *water*, it made the same hissing noise, as a fire-coal put into *water* would do. Besides it *heated* the *water* very much, and much more than common *Oyl of Vitriol* could.

If you fill a *Glass Viol* with the *Decoction* of *Nephritick Wood* clarified, and observe it, turning toward the *Light*, it will appear *Yellow*; but if you turn your back to the *Light*, it will appear *Blew*; if you mix with it some dregs of *Spirit of Vitriol*, it will appear *Yellow* on every side, but if you again add about as much more *Oyl of Tartar*, it will return unto its first colour.

If you take a *Blew*, or *Violet tincture* made in *water*, such as is drawn out of the *Sun-Flower*, or *Violet Flowers*, and pour upon it some drops of *Spirit of Vitriol*, it will presently turn *Red*; but if you throw into it some *Alkali salt*, it will recover again its former colour.

On the contrary if you pour an *Alkali liquor*, such as *Volatile Spirit of Sal Armoniack*, upon the

the *Blew tincture*, it will presently turn *Green*; and if you again pour upon it a little *Spirit of Vitriol*, it will change this colour into an obscure *Red*.

The *Decoction of Indian Wood* is very *Red*: if you drop into it a little *Spirit of Vitriol* it will turn *Yellow*; and if you still add some *Volatile Spirit of Sal Armoniack*, it will become *black*.

All these changes of colour, which the *Spirit of Vitriol*, or other *Acids*, and *Alkali's* do make, proceed only from the different position of bodies dissolved in the liquor, and from its disposition to *modifie the Light* different wayes.

Add to pag. 208.

Remarks upon Distillation of *Alom*.

Some have written that *Alom* yields but very little *Acid*, yet if they'l but take the pains to keep up a strong fire under it for three dayes together, they'l find that this *Spirit* does not give place in strength, or quantity to that of *Vitriol*.

Nor are we at all obliged to distinguish, as they would have us, the *Acrimonious*, *Corrosive salt* of *Alom* from its *Acid*, seeing that there is nothing either *Acrimonious* or *Corrosive* in this *Mineral salt*, which will not turn into an *Acid Spirit*, when it is driven forcibly by fire.

Add

Add to pag. 211.

Remarks upon Flowers of Sulphur.

If you mix one part of *Sal Polychrestum* with two pounds of *Sulphur*, and sublime them together, as those I have described, you'll have *white Flowers of Sulphur*, which are thought to be better for distempers of the *Breast* than those others; they are given in the same *Dose*. This *Whiteness* proceeds from a very exact Attenuation which *Sal Polychrestum* gives to the *Sulphur*; the *Sal Polychrestum* which remains at bottom of the *Cucurbite*, may be *Calcined*, and if you afterwards Purifie it by *Dissolution*, *Evaporation*, and *Filtration*, it will be full as good as before.

Add to pag. 216. Chap.

Of Amber.

Amber is to be found near the *Baltick-sea*, in the *Dutchy of Prussia*, and nowhere else.

Some do think *Petroleum*, or *Oyl of Peter*, to be nothing but a liquor drawn from *Amber* by the means of *subterranean fires*, which make a distillation of it, and that *For* and *Coals* are the remainders of this distillation.

This Opinion would have some resemblance of truth, if the places where this *Oyl* is found were not so far distant the one from the other.

G

for

for *Petroleum* is usually found only in *Italy*, as in *Sicily*, and in *Provence*, this *Oyl* Distills through the clefts of rocks, and it is very probable to be the *Oyl* of some *Bituminous* matter, which the *subterranean* fires had raised.

Tincture of Amber.

Powder finely five or six ounces of *Yellow Amber*, and put it into a *Boult-head*, pour upon it spirit of wine four fingers height, stop this *Boult-head* with another to make a *Circulatory* vessel, and luting exactly the *junction* with a wet Bladder, set it in *Digestion* in warm *Sand*, and leave it so for five or six daies, or until the *Spirit of Wine* is well impregnated with an *Amber* colour; pour off this *Tincture* by inclination, and add more *Spirit of Wine* to the remaining matter, you must digest it as before, afterwards separating the *impregnation*, mix it with the other, filter them, and then distil in a *Limbeck* with a small fire, about half the *Spirit of Wine*, which may serve for the same use as before; keep the *Tincture* that you find at bottom of the *Limbeck*, in a *Vial* well stopd.

It is good for the *Apoplexy*, *Palse*, *Epilepsie*, and *Hysterick* distempers; the *Dose* is from Ten drops to a drachm in some proper liquor.

Remarks.

You must powder the *Amber* very finely, that the *Menstruum* may open it the more easily; this *Tincture* is only the *sulphureous* or *Oily* part of *Amber*, with which the *Spirit of Wine*, which

is a *sulphur*, is impregnated; some other liquor that is not *sulphureous* would perhaps be able to dissolve the *Amber*, but then that which it did dissolve would be but *impure*. And for this reason you must alwayes use a *dissolvent* that is of the same nature with the substance you desire to dissolve.

The Volatile Salt of Amber.

Put two pounds of *Amber* powdered, into a large glass or earthen *Cucurbite*, let it be filled but the fourth part full, set this *Cucurbite* in *Sand*, and after you have fitted a head to it, and a small *Receiver*, lute well the *junctures*, and light a little fire under it for about an hour; then when the *Cucurbite* is grown warm, encrease it by little and little to the third degree; and there will distil first of all a *Phlegm* and *Spirit*, then the *Volatile Salt* will rise, and stick to the head in little *Crystals*; afterwards there distils an *Oyl* first *white* and then *red*, but clear: when you see the *Vapours* rise no longer, you must put out the fire, and when the Vessels are cold unlute them. Gather the *Volatile Salt* with a Feather, and because it will be but *impure* as yet, by reason of a little *Oyl* that's mixed with it, you must put it into a pretty large *Vial* big enough that the salt may fill only the fourth part of it, place the *Vial* in *Sand*, after you have stopp'd it with plain *Paper*, and by means of a little fire, you'll sublime the pure salt in fair *Crystals* a-top of the *Vial*. When you perceive the *Oyl* begin to rise

too, you must then take your *Viol* off the fire, and letting it cool, break it, to separate the *salt*, keep it in a *Viol* well stoppt, you'l have half an ounce.

This *salt* has the same virtues as the other I mentioned before, that is, you may give it from Eight grains to Sixteen in some Opening liquor, for the *Faundies*, for *Ischuries*, *Ulcers in the Bladder*, the *Scurvy*, *Fits of the Mother*, and upon all occasions where there is any need of removing *Obstructions*, and opening by way of *Urine*.

The *Spirit* and *Oyl* have the same virtues as those I have spoke of. If you would *Distil* in a *Retort* the *Mass* which remain'd in the *Cucurbite*, until there comes away nothing more, you'l have a *Black Oyl*, which might serve *Women* to *smell* to in *fits*.

Remarks.

The *Cucurbite* must be sure to be large enough, for otherwise it will break while the *Vapours* are a rising.

A *Clear Oyl* may be drawn from *Amber* in the first *Distillation* by mixing the *Amber* with an equal weight of *Sea-salt*, and *distilling* it in a *Retort* the usual way; there will remain likewise some *Volatile salt* in the neck of the *Retort*, which may be *Rectified* by *subliming* it in a *Viol* as I have said.

Add

Add to pag. 220. chap.

Of Ambergriese.

It is thought to be found no where else but in the *Oriental seas*, though some of it has been known to be sometimes met with upon the *English Coast*, and in several other places of *Europe*; the most of it is found upon the *Coast of Melinda*, and especially at the *Mouth of the River* that's called *Rio di Sena*.

Add to pag. 233.

Remarks upon Distillation of Guaiacum.

During the *Distillation of Spirits*, you must not make the fire too strong, for they coming forth with a great deal of violence, would else be apt to break either the *Retort* or the *Receiver*.

Though the *Guaiacum* that is used is a very dry body, yet abundance of *liquor* is drawn from it; for if you put into the *Retort* four pounds of this *Wood*, at sixteen ounces to the *Pound*, you'll draw at least a *Pound* of *Spirit* and *Phlegm*, and four ounces of *Oyl*; as for the *salt*, you'll gain but half an ounce, or six drachms at most.

Add to pag. 238.

Remarks upon Oyl of Cloves per Descensum.

If you use a pound of *Cloves*, to Distil them *per Descensum*, according to the Description I have given, you'll draw an ounce and two drachms of *White Oyl*, and an ounce of *Spirit*; there will remain thirteen ounces and two drachms of matter, from whence might still be drawn a little *Red Oyl*.

Add to pag. 249. lin. 6. Chap.

Of Wine.

'Tis *Objected* to this last discourse, that the *Tartareous* part being in a *Natural* way separated from the *Wine*, should in no wise diminish the quantity nor the strength of the *Spirituous* and *Inflammable* part.

But when I asserted that the *Spirits* of divers *Wines* are extremely much loaded with *Tartar*, I did not mean that *Tartar* which *Petrifies* at the sides of the vessels, for that same is quiet, and does not hinder the *Exaltation* of *Spirits*; but I intended a *Tartar* that still remains mixt in the *Wine* after the *Fermentation*, and which according as it abounds more or less, does render the *Wines* more or less thick and gross. It is easy to see this *Tartar* I speak of, if you evaporate the

the *aqueous part* of *Wine*, for it will remain at bottom in form of *Lees*. Nevertheless there is no need of establishing two sorts of *Tartar* in one kind of *Wine*, for the former is only the more *soluble* part of the latter.

Divers little *Objections* have been made me on this subject, for want of duly examining what I have established. Wherefore I have no desire to enlarge my self in the relation of them, for it is my aim, as much as I can, to avoid all *Repetitions*, as being of no further use but to swell a *Book* and tire the *Readers* patience.

Add to pag. 256. lin. 32. in the

Remarks upon Spirit of Wine.

Some persons do endeavour to reject the *Method* that I have described for drawing *Spirit of Wine*, because, say they, a long time is required to draw a little *Spirit*, and by reason of the difficulty they conceive in procuring such Vessels well made, at *Paris*, and much more so in the *Countrey*.

But it is likely these Gentlemen do blame this *Method*, before ever they tried it; for if they had but taken the pains to make the *Experiment* of it, they would have found that with two or three of these Vessels, they might have drawn as much *Spirit of Wine*, as they could be able to do with their great *Machine*; and that this *Spirit* is not liable to the *Impression* which might be communicated to it from *Copper* or *Tin* vessels.

As for the difficulty that there is pretended of finding these *Glass* vessels, there is none at all that I know of, but only for such as will not take the pains to *visit* the *Glass-houses*, for there they would find enough for their turn; and though I use a great many of them in my *Courses of Chymistry*, I never was to seek for any yet. But suppose there were none to be found ready made, methinks they might as easily bespeak 'em, and have 'em made at the *Glass-houses*, as well as bespeak those grand *Copper* or *Tin Machines*, that are commonly used. I know those that are better pleased with making a *Fair shew*, than with the *effects* of things, and who measure the *goodness* of an *Operation* by the *trouble* it gives one, and by the *greatness* of *Vessels* and *Furnaces*, will find here but little to their *satisfaction*. But I am very little concerned at such mens exceptions, I never at all endeavoured to follow their *Road* way. My design is simply to facilitate the means of working in *Chymistry*, and to despoil it, as much as lies in my power, of those things which render it *mysterious* and dark.

Add to pag. 258.

Remarks upon Spirit of Wine Tartarized.

A sign, that the *Spirit of Wine* has carried along with it some of the *Salt of Tartar*, is this: if you dry gently the *Salt of Tartar* that remains in the *Cucurbite*, and weigh it, you'll find it diminished an ounce and a half.

You

You may again put this *Spirit of Wine Tartarized* to half a pound of more *Salt of Tartar*, in a *Limbeck*, and *distil* it as before, but I have found that it is ne'r a-whit the better for it.

This way of *Tartarizing Spirit of Wine* is the very best and shortest of all that have been invented, whether you desire to make it *Pure*, or to *impregnate* it with *salt of Tartar*; and I may venture to say, that all the many long and tedious descriptions that have been given of this Operation, have been only invented to cast a dust into the eyes of *Novices*; for it is easie for any to observe, who give themselves a little to examine things, that after all their long turnings and windings, and circumstances to no purpose, the *Spirit of Wine* is not so well *Tartarized*, as by the plain Method that I have described.

Add to pag. 259.

Remarks on the *Queen of Hungary's Water*.

The *Oyl* or *Essence* of *Rosemary* may be made as the *Oyl* of *Cinnamon*, and some drops may be put into *Spirit of Wine*, and thus we have a *Queen of Hungaries Water* presently made upon the spot. The *Water* of the *Queen of Hungary* sometimes gives ease to the *Tooth-ach*, being snufft at the *Nose*, or applied to the *Gums* with a little *Cotton*.

Some endeavouring to *Criticize* to little purpose, do say, it is altogether useless to digest
Rose-

Rosemary Flowers with *Spirit of Wine*, because their substance being of a very *Volatile* nature, it easily *dissolves* without any *Digestion*.

But this *Circumstance* is very *necessary*, if we desire to have a *Water* well *impregnated* with the *Essence* of the *Flowers*, for although there is a *Volatile* substance in *Rosemary*, yet good part of the *Oyl*, in which consists principally the *Smell*, is involved in the other *Principles*, and it cannot be well *Rarified*, mixed, and *Exalted*, but only by a *Digestion*: and thus we find a very good *Effect* from it.

Add to pag. 260. last line, Chap.

Of Vinegar.

Perhaps it will be *Objected* that *Wine* separated from *Tartar* and *Lees* grows *sowre*, when kept a long time in a vessel, without any *dissolution* of *Tartar*.

But we must consider that *Wine*, let it be as clear and pure as may be, does always retain the more *salt* and *subtile* part of *Tartar*, which exalts and easily smells, when by the *Fermentation* it gets the predominancy of the *Sulphureous Spirits*, which held it as it were involved: and thus clear *wine* sours when alone, but it does not sour so fast, and the *Vinegar* is not so strong, as when it is made upon *Tartar*.

Furthermore if we consider the *Principles* that *Wine* consists of, we shall find, that neither the *Oyl*, nor *Earth*, nor *Water*, are capable of
yielding

yielding any *Acidity*, and that nothing but the *Salt* is able to give it. Now it can't be doubted but that the *Salt of Wine* is in the *Tartar*.

It may be added here, that the *Air* to which *Wines* are exposed, by leaving the vessel open, when they would have them turn into *Vinegar*, does likewise communicate a little of its *Acidity* to the *Wines*, in the stirring up, and rarifying the *Acid of Tartar*.

Add to pag. 262.

Remarks on Distillation of Vinegar.

Some having dried and calcined the sweet extract that remains at the bottom of the *Cucurbite*, after the *Distillation of vinegar*, and having by *Dissolution*, *Filtration*, and *Congulation*, separated an *Alkali fixt salt*, much like unto that which is drawn from *Tartar*, they do mix it with *Spirit of vinegar*, and *Distil* and *Cohobate* it divers times, until, say they, the *spirit* has carried off all the *Salt*, and then will needs have it called *Spirit of vinegar Alkalized*, or *Radical spirit of vinegar*, and they assert that this being much more pure, and entirely united with its proper *salt*, is much more powerful in dissolving *Metals*. But far from the *Distilled vinegars* becoming the stronger through this Preparation, I can demonstrate that it breaks and loses the greatest part of its points in contending with the *Alkali salt*, with which it is mixt, for 'tis the property of this *salt* to sweeten *Acids*.

Nei-

Neither is it necessary to believe that by *Distillations* is drawn the *Alkali salt of Vinegar*, for it remains fixt at bottom of the *Retort* with the *Acids* it is *impregnated* with; so that this same *Spirit of Vinegar* to which so many great names and uses have been appropriated, is properly the more *Phlegmatick* part of *distilled vinegar*.

Add to pag. 264.

Remarks on Crystals of Tartar.

I see no reason so much to wonder as some do, why *Tartar* will not *dissolve* in *cold water*; for although it does contain a great deal of *Salt*, this *salt* is involved in *Earth*, and *Oyl*, which must needs hinder this *dissolution*, and there's no need of having recourse, for an explication of this, to a proportionate Union of *Volatile salts* and *Acids*.

Add to pag. 264.

Soluble Tartar.

Powder and mixe together eight ounces of *Crystals of Tartar*, and four ounces of the *fixt salt of Tartar*, put this mixture into a glazed earthen Pot, and pouring upon it three pints of *common water*, boil the matter gently for half an hour; then letting it cool, filter and evaporate the liquor until it is dry, and there will remain at bottom, eleven ounces six drachms of a *white salt*;

salt; keep it in a *Viol*, 'tis both a good *Aperitive*, and *Laxative*, it is good for *Cachexies*, *Dropsies*, and all *Diseases* that proceed from *Obstructions*: the *Dose* is from ten grains to two scruples in Broth, or some proper liquor.

Remarks.

This Operation is nothing but a *Dissolution* that the *Salt of Tartar* has made of *Cream of Tartar*, so that it can dissolve in cold water, which it could not do being alone; the *Cream of Tartar* also being an *Acid* insinuates into the *Pores* of the *Alkali salt*, and sweetens it.

If you Boil *Cream of Tartar* in water, and put into it some *salt of Tartar*, there will happen an *Effervescency* between 'em, but if you mix these two Ingredients together in cold water, there will be no *Effervescency*; the reason of which is, that the *Acid Spirits* of *Cream of Tartar* being involved in other *Principles*, can have no active power to penetrate the *Alkali*, unless they be actuated by fire.

I use to filter the *Dissolution*, in order to separate some terrestrious part of the *Cream of Tartar*, which could not dissolve: this salt comes near to *Tartar vitriolated* for virtues, some do call it *Vegetable salt*.

Chalybeated or Martial Crystals of Tartar.

Powder and mix a pound of good white *Tartar*, and three ounces of *Rust of Iron*, boil this mix-

mixture in an *Iron Kettle* with five or six quarts of *water*, for half an hour, or so much time as is requisite to dissolve the *Tartar*, pass the liquor hot through a warm cloth, then let it alone to settle in an *Iron or Earthen Pot* ten or twelve hours, it will shoot into *brown Crystals*, at the sides and bottom of the Pot, pour off the liquor by *Inclination*, and gather the *Crystals*; then evaporate over the fire about half the liquor in the same Pot, then let the remainder settle, and take out the *Crystals* as before; continue these *Evaporations and Crystallizations*, until you have drawn out all your *Tartar*, dry the *Crystals* in the *Sun*, and so keep them.

It is a good remedy for *Obstructions* of the *Liver, Mesentery, Spleen*; it is given in *Cachexies*, and for *Melancholy*, and the *Quartan Ague*; the Dose is from fifteen grains to two Scruples in Broth or some other liquor proper to the Distemper.

Remarks.

This Preparation is boil'd but little, that the *Tartar* may dissolve only the more *Saline* part of *Iron*; the liquor is made to pass through a cloth, to free it from the *Impurities* of the *Tartar* and *Iron* that could not dissolve; but you must pass it very hot, for if it were a little cool, the *Tartar* would *Coagulate* in the Cloth, and so none of the liquor would pass.

Instead of *Crystallizing* the dissolved *Tartar*, you may evaporate all the liquor, and so obtain a
brown

brown powder, which has the same virtues as the Crystals.

When you would exhibite this *Chalybeated Crystal of Tartar*, you must make it just boil in the liquor you give it in, for otherwise it will not dissolve, and you must be sure to give it as hot as they can take it, for fear it should Crystallize at the bottom of the Poringer or Cup.

Soluble Tartar Chalybeated.

Put into an Earthen Pan, or Glass vessel four ounces of *soluble Tartar*, and sixteen ounces of *Tincture of Mars* prepared according to the description that I have given, set the vessel in sand, and with a small fire evaporate the humidity of the liquor, until there remains a black powder, shut it in a viol well stoppt, and keep it, you'll have eight ounces of it.

This *Martial Tartar* has the same virtues as the *Tincture of Tartar*, it is good to remove all *Obstructions*, wherefore 'tis very properly used in *Cachexies*, *Dropsies*, retention of the *Menstrua*, in *Nephritic Colicks*, and difficulties of *Urine*: the Dose is from ten grains to half a drachm, in some proper liquor, or else made into *Lozenges*.

Remarks.

This Preparation of *Chalybeate*, or *Martial Tartar* is not only more convenient for use than the former, (in that it dissolves, or mixes in

a cold liquor) but has much more virtue in it, for the *Tincture of Mars* contains only the more salt part of *Tartar*.

Add to pag. 265.

Remarks on Soluble Emetick Tartar.

Volatile Spirit of Sal Armoniack may be used instead of that of *Urine*; but then there will appear no sensible *Ebullition*, the reason of which is, because the salt of this *Spirit* is not so open as the *Spirit of Urine*; by reason of some impression it has of the *Acid sal Armoniack*, with which it was mixt; insomuch that the *Crystals of Tartar* whose *Acid* is not separated from the *Earth*, has points too gross and too unactive to insinuate into the *Pores* of this salt, and divide its parts so easily as those of the salt that's contained in *Spirit of Urine*, whose *Pores* are bigger.

Another sort of *Soluble Emetick Tartar* may be made by boiling in Water an ounce of the *Glass of Antimony* in Powder, with four ounces of *Soluble Tartar*, for seven or eight hours, then upon Filtring and evaporating the liquor, there will remain a grey Powder of the same virtues as the other, and to be given in the same Dose.

Add

Add to pag. 268.

Remarks upon the Fixt Salt of Tartar,
and its Oyl.

I commonly use to draw this way four ounces of very *white*, and well *Purified salt of Tartar*, from each pound of *Red Tartar*; a little more may be drawn from *white Tartar*, but it is no better than the other.

I have observed that when *water* is thrown upon the *Mass* of *Tartar* newly *Calcined*, it *heats*, much like unslack't *Lime*, when wetted; the reason of which is the same that I have given, to explicate the *Ebullition* of *Quick-lime* in *water*: all the difference is this, that *Tartar Calcined* containing a great deal of *Salt*, does more easily imbibe *water* than *Quick-lime*.

Some do *Calcine salt of Tartar* with a little *sulphur*, to hinder it from *dissolving* so easily by the *Air*, and to *whiten* it the more; but this is no good practice, because the *Acid Spirit* of *sulphur* destroyes some part of the *Alkali*; and this does come to happen, by reason that the *Pores* of this *Salt* by being thus *Calcined* are not so open as they were, and the *Air* therefore cannot so easily *melt* it. If you would desire to make *Salt of Tartar*, and other *Alkali fixt salts* very *white* indeed, you must *Calcine* them all alone in a great fire, until they become *white*, and then *Purifie* them by *Dissolution*, *Filtration*, and *Coagulation*. As for their proneness to
H dissolve,

dissolve, this accident is *Natural* to *Alkali salts*, and it cannot be taken from them, but by destroying their nature.

Nor can I approve the addition of some quantity of *Niter* to the *Calcination* of *Tartar*, as some will do, because the *Volatile* parts of *Niter* being exalted, the *fixt* do remain, and by their *Acidity* do diminish the virtue of *Salt of Tartar*.

Alkali salts are *Aperitive*, in that they dissolve those *slimy* humors which caused *Obstructions*; and it is for the same reason that *Salt of Tartar* does correct *Senna*, and hinders it from griping, for the substance of *Senna* being *Viscous*, this does *Rarifie* it, and make it work the quicker; it may also serve to dissolve some *viscous Phlegm* that sticks to the *Intestines*, which as it is going off, causes griping pains.

Add to pag. 272. the last line in

Remarks upon Magistery of Tartar, or Tartar Vitriolated.

If you use two ounces of *Salt of Tartar* in this Operation, you'll draw two ounces and a half of *Tartarum Vitriolatum*. This *Augmentation* comes from the more heavy and strong part of the *Vitriol*, for the humidity that is *Evaporated* is very *Phlegmatick*.

You may here use the *Rectified Oyl of Vitriol* instead of the *Spirit*, and then the less is requir'd, because it is a stronger *Acid*, but the *Tartarum Vitrio-*

Vitriolatum will not be so white, as when *Spirit of Vitriol* is used, by reason of some *Tincture* that always remains with *Oyl of Vitriol*, Rectifie it as much as you please.

Though some have written, that if *Tartarum Vitriolatum* should be put into a *Retort*, and actuated by fire, one might draw *Spirit of Vitriol* as good as it was at first, nevertheless 'tis certain 'twill not be so strong a *Spirit*; for it has lost the most subtle part of its *Acidity*, by encountring with the *Alkali*, which may be easily judged both by the *Taste*, and the *Effects*.

If by way of *Curiosity* you would search a little narrowly into this Operation, and observe what happens during the *Ebullition* of *Acid* and *Alkali*, you'll find, that a great many little dashes of water do fly about, especially if the vessel is not placed too low, and you hold a lighted *Candle* near it, for they will be apt to put it out. This *Effect* can have no other cause than the violent separation of the parts of *Alkali* by *Acid*, which makes the watry part of this liquor sprinkle it self upwards, it being on all sides furiously driven.

If you use *Oyl of Vitriol*, the *Ebullition* is the greater, and the heat the more considerable, because its *Acid* being stronger, it separates the parts of the *Alkali* body with more ease.

Now considering the *Ebullition* which happens between *Acid* and *Alkali*, I have the less opinion of a *Method* that some follow, which is to bathe a little the bodies that are to be *Embalmed*, with *Spirit of Salt*, and then to put *Salt of Tartar*

into the *Embalming Powder*; for it is very likely, that this *Spirit of Salt*, which is an *Acid*, by mixing with the *Alkali salt of Tartar*, produces a *Fermentation* which may stir up the remaining humidity of the *Carkass*, and make it enter into the *Ingredients* of the *Powder*, and so instead of *Preserving* the dead body intire, we may have reason to fear lest this *Fermentation* should rather hasten the *dissolution* of its parts.

Add to pag. 274. lin. 27. in the same

Remarks.

Leaven does encrease the *Fermentation* in *Dough*, as being a *Paste* it self, whose *salts* are made free by a long *Fermentation*; these *salts* do joyn with those of the other *Paste*, and assist them both to rarifie and dissolve.

The same thing may be said of divers other *Acids* which do cause a *Fermentation*.

But when the *Acids* have rarified the matter as much as they can, they there lose their motion, and then there happens a kind of *Coagulation*, that is to say, the matter returns into its first dimensions.

Again there is one effect of *Acids*, which seems different from those I mentioned before, and it is that they can preserve certain bodies that are put into them, as salt preserves meat. Thus when young *Cucumbers*, *Saxifrage*, *Capers*, &c. are set a steeping in *Vinegar*, there happens no *Fermentation* at all, and consequently no *Corruption*.
The

The reason of which is, that the parts of *Cucumbers*, and other things I mentioned, being of a *viscous* nature, the *Acids* do insinuate into them for to dissolve them, but they have not motion there free enough to make their attacks, and separate the parts, so that the *Acid* of *Vinegar* does only fix it self in the Pores of these bodies, and there *Coagulate*.

It is this *Coagulation* that hinders the *Cucumbers* from *corrupting*, for these *Acids* do stop up their *Pores* and serve as so many little *Peggs*, to keep the parts firm and quiet. *Sea-salt* which is an *Acid* does preserve meat, and several other things for the same reason; but I have spoken something of that in the *Remarks* upon the *Principles*.

Add to pag. 276. the end of the same
Remarks.

Another *Objection* may be made to what I have said touching *Digestion*; it is, that whereas I maintained that *Acids* do *Dissolve* when they abound, and *Coagulate* when there are but few in a great deal of matter, it should happen that *Spittle* should then be apter to *Coagulate* the *Aliments* in the *stomach*, and cause *indigestion*, than would a greater quantity of *Acids*, for it seems, according to my *Discourse*, the more *acids* are found in a matter, the more liable it must be to *dissolve*.

To resolve this difficulty, which seems to be very considerable, we must observe, that the

natural acids of *Aliments* taken into the *stomach*, are sufficient to *rarefie* and *dissolve* those bodies which hinder their motion, when they have been stirr'd up by *Mastication*, or by some *salt* of the *spittle*, which serves as a *Leaven* to them, much after the same manner as the *salts* of *Meal* do *rarefie* the *Paste*, when they are actuated by means of *Trituration* and *Leaven* together; but now if there happens to be too much *acid* in the *Aliments* that are taken into the *stomach*, they will have the same effect as *Cucumbers* and those other things I mentioned, which *preserve* in *Vinegar*. The *acids* will indeed endeavour to cut in pieces what stands in their way, but having to do with parts too viscous and heavy, they will soon lose all their motion, and fix by their quantity, and by their gravity the *natural salt* of these *aliments*, as *Vinegar* fixes that of *Cucumbers*; for whereas the *acids* do shut the *Pores* of the matter, and keep them firm and quiet, the *natural salt* can't be able to *exalt* so as to cause *Fermentation* or *Digestion*.

The reason then why a small portion of *acids* will cause *Digestion* in the *stomach*, and a greater quantity will hinder it, is that the small quantity will joyn with the *natural salt* of *aliments*, and have its operation without stopping the *Pores* of the matter, whereas a great store of *acids* will quite stop up the *Pores* of this same matter, and hinder the motion of the *natural salt*; for it is not enough that there are a great many *acids*, to cause a *dissolution*, these *acids* must have room to move in, and make their attacks.

Thus

Thus these *Effects* make nothing against what I asserted concerning *acids*, for a greater quantity of them will always have more disposition, and tendency to a *dissolution*; but if this great quantity does *Coagulate* divers things, it is only by accident, and by reason of the disposition of the matter into which the *acid* points do ule to enter.

What I have established concerning *acids* may serve very much towards the explicating of *Feavers*, and their principal *symptoms*.

First of all every body must grant, that when there are *Obstructions* in our Bodies, the *obstructed* matter does *Ferment* and *sowr*, as *Dough*, *Wine*, and several other things grow *sowr* by being *stale*.

This matter by *Fermenting* sends *salt* or *acid* vapours into the *Mafs* of *Bloud*, which do cause diverse Alterations in it, according to their quantity, and quality, for these *acids* are commonly mixt with *sulphurs*, which are a kind of Vehicle to the *acids*, and are more or less *corrupted*, according as the matter whence they are derived have sojourned more or less in the *Obstructed* part.

Now if these *acid vapours* are carried into the *Vessels*, but only in such a quantity as is fit to make a kind of *Leaven* in the *Bloud*, they will then *rarifie* the *Bloud* too much, and whereas they by consequence encrease its *motion* and *heat*, they do cause that which we call a *Feaver*; this *Feaver* must remain as long as the *Ferment* continues in the *Bloud*, and according as

there comes a new supply of matter in place of what nature has thrown off.

But if a greater quantity of *acids* rises all of a sudden from out of the *Obstructions*, then there must needs happen a kind of *Coagulation*, for these *acids* thus abounding, and fixing the grosser part of the *Bloud*, do partly lose their motion, and quiet the *Ebullition* of the *Bloud* by fixing its parts.

It is this kind of *Congelation* which causes those Cold Shiverings, which are felt, before the Hot Fit begins; for as the Heat is derived from the motion of the Spirits, the Cold is produced from the cessation of their motion.

The *Cold fit* continues until the *Spirits* have by their activity *rarified* this *Congelation*; for the *Spirits* being continually supplied with additional forces do violently assault the passage 'till they have broke it open, and made their way free.

The *Coagulum* being *dissolved*, the *Bloud* should seem to *Circulate* as it did before, but because the matter of the *Coagulum* is converted into a *Leaven*, this *Leaven* makes the *Bloud* to *Boil*, and so causes a *Feaver*; this *Feaver* continues until the *Bloud* is freed from all this *Ferment*, either by *Transpiration*, or by way of *Urine*.

Now to conceive how this *Coagulum* may be converted into a *Leaven*, we must consider that the *Spirits* of the *Bloud* have lost most of their *acidity* in *dissolving* this *Coagulum*, and that there remains but only *acidity* enough to produce a *Fermentation*.

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Nevertheless you must not think I mean by this *Congelation* now spoken of, a *Coagulum* altogether like unto that in *Milk*, or to that which happens, when an *acid* liquor is *syring'd* into the *Veins* of an *Animal*, for these *Congelations* are too strong, and there would then happen to us the same thing, or very near the same as does to the *animal*, who soon afterwards falls into *Convulsions*, and *dies*, because the course of the *Spirits* and *Bloud* would be intirely stop't, and they would never be able to break through so great an obstacle: but I understand here that the *Bloud* is made thicker than it was, and has not so free a motion as it had before, which is enough to cause such *cold Fits*.

Now there remains for me to explicate how it comes to pass that *Feavers* have their abatements and returns regularly by *Fits*.

The matter that makes the *Obstructions* which I have laid down for the *Fundamental Cause* of *Feavers*, begins not to send out its vapours, nor disperses its *acid salt* into the *Bloud* in order to cause a *Feaver*, until it has got together a certain quantity in the *obstructed* vessels, and then it is probable there is a kind of *Eruption* of the matter.

This *Eruption* of *Feaverish* matter must happen at set times, so long as the *Obstruction* lasts, because the humors which *Circulate* to the *obstructed* parts, and there stop, are alwayes in an equal quickness and quantity.

Now seeing that in a *Tertian Ague*, the vessels wherein the *obstruction* happens, do acquire in two
dayes

dayes time a sufficient repletion of matter to produce the *Eruption* and *Fermentation* I have spoken of, the *Fits* do come to operate every second day.

But because in a *Quartan Ague* the humors are more tenacious and heavy, and flow with expedition, the *Fermentation* and *Eruption* must needs be slower and consequently the *Fits* more distant the one from the other.

The *Quotidian Ague* is caused by a *Salt Pituita*, which is naturally fluid enough to make the matter ferment in less time, wherefore it is that the *Fits* do return every day.

We may reason concerning the other kinds of *Fevers* upon the same *Principle*, and explicate all the accidents that happen, but I have no design to enlarge my self further upon this subject, I should think it would be too great a *Digression*, and a Book might rather be made on purpose, to express all the circumstances which might be deduced from it.

Volatile Salt of Tartar.

Dry the *Lees* of *Wine* in a gentle fire, and fill with them two thirds of a large earthen or glass *Retort*, place this *Retort* in a *Reverberatory Furnace*, and fitting to it a large *Receiver*, give a small fire under it to heat the *Retort* by degrees, and to drive out an insipid *Phlegm*; when vapours begin to rise, you must put out the *Phlegm*, and luting carefully the *Junctures* of your vessels, quicken the fire by little and little, until you find the
the

the *Receiver* filled with *white Clouds*; continue it in this condition, and when you perceive the *Receiver* to *cool*, raise the fire to the utmost extremity, and continue it so, until there rise no more *Vapours*. When the Vessels are grown cold, unlute the *Receiver*, and shaking it about to make the *Volatile salt* which sticks to it fall to the bottom, pour it all into a *Boulthead* with a long neck; fit to it a *Head* with a small *Receiver*; lute well the *junctures*, and placing it in *sand*, give a little fire under it, and the *Volatile salt* will rise, and stick to the *head*, and the top of the *Boulthead*; take off your *head*, and set on another in its place: gather your *salt*, and stop it up quickly, for it easily dissolves into a liquor; continue the fire, and take care to gather up the *salt* according as you see it appear; but when there will rise no more *salt*, a *liquor* will *distil*, of which you must draw about three ounces, then put out the fire.

This *salt* is had in great request to *Purify* the *Blond*, by *Sweat* or *Urine*: it may be given in the *Palsie*, *Apoplexy*, *Epilepsie*, *Quartan* and *Tertian Agues*, to open *Obstructions*; the *Dose* is from six grains to fifteen in some proper liquor.

The *Distilled liquor* is a *Volatile salt* that's risen with *Phlegm*; it is called the *Volatile Spirit* of *Tartar*, and has the same virtues as the *salt*; its *Dose* is from eight to four and twenty drops.

After this same manner the *Volatile salt* of *Beans*, *Soot*, and divers *Fruits* and *Seeds* may be Prepared.

Re-

Remarks.

The *Lees* of *Wine* being incomparably more *Fermented* than the *Tartar* which is found in the sides of Vessels, we need not wonder if its *salt* is more *Volatile*.

This *salt* is *sublimed* in a *Boulthead* with a long neck, to the end the *Phlegm*, which is too heavy to rise easily so high, may not much mix with it; but it is extraordinary hard to keep this *salt dry*, it easily humects and dissolves into liquor, wherefore it were much better to draw it in a *Spirit*, and less of the *Volatile* part would be lost, being detained by *Phlegm*.

Nevertheless because there are several persons who are as well pleased with the *sight* of things, as their *Effects*, this *liquified salt* might be mixt with a sufficient quantity of *Calcined Bones* powdered, to make thereof a *Paste*, which might be made into little *Pellets*, to be put into a *Boulthead*, and fitting to it a *Blind head*, this *salt* may be *sublimed* or *Rectified* as before, and this pure *salt* must be kept in *Viols* well stoppt.

The difficulty there is in keeping this *Volatile salt dry*, as well as that of other *Vegetables*, does proceed from this, that only the more *Essential* part is *Volatilized*, for there remains much *fixt salt* with the *earth* in the *Retort*.

This *Volatile salt* becomes *Alkali* by the means of fire, as the other *Volatile salts* do, whereof I have already spoken in my *Remarks* upon the *Principles*; and there is no manner of probability

lity that it should have been of this nature, either in the *Plant* or in the *Lees*, for the reasons that I have shewn in the same *Remarks*.

I shall add here, that if the *Alkali salt* did exist in the *Lees*, but is not able to unfold it self, and get the predominancy of *Acids* but only by a long *Fermentation*, as the *Chymists* will have it, who follow the common way of discoursing of these things, it would then necessarily follow that the more *Lees* do *Ferment*, the more they must lose of their *Acidity*, because the *Alkali* would destroy it. Nevertheless the contrary to this happens; for *Lees* do *sowr* as they grow *stale*, and those who make your *Vinegar*, do know well enough how to use *Lees*, and make them *Ferment* with their *Wine*, when they would use a quick dispatch in making *Vinegar*.

It seems to me from the consideration of this effect, that there is little reason to follow the Sentiments of some, who have writ that the *Lees* of *wine* abounding in *Volatile salt*, and a *sulphureous spirit* do contain but very little *Acid*; for it is as plain as may be that this *Volatile salt* is *Acid* in the *Lees*, and is the same that makes the *Acid spirit* of *Vinegar*, as being more *Volatile* than many other *Acids*, to *Volatilize* along with its *Phlegm* in the *distillation*. It is true that *salt* of *Tartar* drawn by the *Retort*, does rise more easily than the *Spirit* of *Vinegar*, but this is from its being *Volatilized* by the violent heat of fire.

Another mark that all the *salt* of *Lees* is *Acid*, is this, that the *Tartar* does all *dissolve* in the *wine*, and turns into *Vinegar*; for very little or
no

no *Lees*, or other *Tartar*, is to be found in the *Barrels* wherein *Vinegar* was made, although there was some before as nature made it, or though some other was added to it.

Perhaps it will be *Objected*, that *Lees* are sometimes added to *Wines* grown ropy and mucilaginous to make them good again, and those *Wines* are not sowed by the *Lees*.

But this effect happens, when the former *Fermentation* becoming imperfect, through the too great quantity of *Phlegm* for the little proportion of *Salt* that was in the *wines*, the *salt* of the *Lees* does rarifie, exalt, and involve it self in some measure in the *Oily* parts of the liquor that the *wine* is made of, as I have said in the *Chapter of Wine*.

For the *Wine* does not sower, so long as the *salt* finds *Oyl* to act upon, but it does so, when this *salt* finds nothing to hinder it from separating.

The *Volatile salt* of *Tartar* produces much the same effects, as that of *Beans*, and other *seeds*, and though many will needs give it such sublime and extraordinary virtues in comparison with other *Volatile salts*, I do not see any reason for such high fancies, nor that effects do answer their Pretences.

Volatile salts have a good use, when they find the *Pores* and *Humors* disposed for *Transpiration*, but they are full as dangerous, when the *Humors* are not at all *Prepared*; for by their *Volatility* they do so stir them up, that oftentimes the *Feaver* is known to be encreased by them, and translated

to the *Brain*: wherefore you must be sure to consider well the *Temper* and present state of your Patient, before you presume to give them.

That which remains in the *Boulthead*, after the *Volatile salt*, and *spirit* are drawn off, is a black and stinking *Oyl* mixt with the more *Phlegmatick* part of the liquor; you must separate this *Oyl* in a *Funnel* lined with brown paper; it is good for the *Palsie*, *Cold pains*, and for *Hysterick* women to smell to.

A *Lee* or *Calcined Tartar* is found in the *Retort*, out of which you may draw a fixt *Alkali salt*, as out of common *Tartar*, but in a lesser quantity, for that the greatest part of the *Salt* of *Lees* is *Volatilized*.

Add to pag. 278.

Extract of Opium called Laudanum.

Opium does mitigate all pains which proceed from too great a subtilty of the humours, it is good for the *Tooth-ach*, being applied to the *Tooth*, or else made into a *Plaister*, and applied to the *Artery* of the *Temples*; it is used to stop *spitting of blood*, *Dysenteries*, *Fluxes* of the *Menstrua*, and the *Hemorrhoids*, for *Colicks*, *defluxions* of sharp humors upon the *eyes*, for *Rheumatisms*, and to ease all sorts of *Gripping pains*. The *Dose*, &c. as before.

Add

Add to pag. 284.

Remarks upon Landanum.

Some have writ in opposition to what I have establish'd on this subject, and say, that if we have regard to the quantity of *Narcotick vapours* that may arise from a *small Dose of Opium*, it ought not to be imagined that those *Vapours* should be able to shut the channels of the *Spirits* and *humours* which make a *defluxion* upon some part; but that we should rather conclude the *mitigation of pains*, and *stopping of defluxions* to proceed from a just proportion of the *salt and sulphur of Opium*, and from the *secret Ferment* they contain.

But this *Objection* will give us but little trouble in the answering, when we consider that although the *Vapours* caused by it are but few, yet the vessels of the *Brain*, in which the *Animal Spirits* do move, are exceeding delicate, and easie to be obstructed; and that the too great activity of the *Spirits*, which often fly into the diseased parts, being thus abated by the *viscous* nature of *Opium*, there must needs follow thereupon some ease and comfort, without any need at all of admitting a *stoppage* of the *Vessels*. And again we may conceive, that all the *Opium* that was taken, being capable of being *Rarified* into *vapours* by the *heat* of the *body*, there must needs be produced good quantity of them.

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As for the proportion of *Salt*, and *Sulphur* in *Opium*, and the *secret Ferment* they pretend to acquaint us with, in order to *Explicate* this matter, I know they are high terms indeed, but illustrate very little, for though they say these *salts* and *sulphurs* do unite with *Homogeneous* particles that they meet with, and destroy such as are the cause of the Distemper, we can never by this means receive any clear *Idea* of that which makes *Opium soporiferous*.

Besides the virtue which *Opium* has to cause sleep, I have observed that it is often *Sudorifick*. I conceive this effect must not be attributed only to the *Volatile* parts of this mixt, which may be thought to operate this way, after they are disengaged from its *viscosity*, but rather to this, that during sleep, the inward vessels being as it were *obstructed*, or in some manner *Coagulated*, and the *Spirits* finding resistance in their passage, do *reflect*, or turn their motion to the outward parts, and draw along with 'em some *moisture* through the *Pores*. That which confirms me in this opinion is the consideration, that divers persons do use always to sweat, when they are a-sleep, though they have not taken any *Opium* at all. Now it may happen that in the operation of *Opium*, the *Spirits* finding more resistance within than they are wont, may tend outwards with the more force, and consequently incline to sweat more than in *natural sleep*.

Some prejudiced *Chymist* may not relish perhaps this my *Explication*, because I don't season

it with salt enough, and sulphur, and other Principles; but although the five Principles which may be drawn from other Vegetables, may also be drawn from Opium, I never use them but to explicate some Effect; for whensoever I find they are not able to satisfy my reason, nothing shall hinder me from pursuing my thoughts and searching elsewhere for some better explication. In fine the Beauty of Chymistry does not consist in suiting our opinions to those of ordinary Chymists, who resolving to explicate all the Events of nature by their received Principles, which they manage according to their own fashion, do reject as ridiculous whatsoever does not agree with their Sentiments; but it rather consists in examining and imitating what is done Naturally, and so searching for reasons that are most probable, and such as may be said to come nearest to truth, though one is fain to forsake the way that others have trod in,

Add to pag. 285. Chap.

Of Aloes.

Aloes is not only used inwardly, as I shall say speaking of its Extract, but it is also used outwardly in many Unguents and Plaisters that are Deterfive, and Resolutive.

Its Tincture is also drawn with Spirit of wine, by the same Method as I shall describe that of Myrrhe; it is resolute, deterfive, good against Gangrenes, and to Incarnate; it is used in Injections to dissolve Gypsous humours, and to cleanse Wounds, and old Ulcers.

Add

Add to pag. 292. lin. 3. in

Remarks on *Extractum Panchymagogum*.

Spirit of Wine is commonly used to make this *Extract*, and it may seem to be so much the purer, being drawn by this *dissolvent*, rather than by a *watry menstruum*; for *spirit of wine* dissolves only the more *Balsamick* and purer part of *mixt* bodies: but nevertheless I choose rather to prefer the use of *Dew*, or else *Rain-water*, nay and *common water* before *Spirit of wine* for several reasons.

First, because in the *Evaporation* of the humidity of the *Extract*, drawn by *Spirit of wine*, a great many of the more *subtile* parts are lost, which this *dissolvent* had *Volatilized*. And indeed it cannot be denied, but some parts will *evaporate*, let us use what *dissolvent* we please; but it is plain there is no such great loss, when *watry menstrooms* are used, as when *spirit of wine*. Now we should always prefer such *menstrooms*, as are best able to *preserve* the *virtue* of the *mixt*, whose *Extract* we intend to draw.

The second is, because *Spirit of wine* does alwayes leave some *impression* of *heat* and *acrimony* in the *Extracts* it draws, which the *liquors* that I use don't do.

The third is, because *spirit of wine* is not so convenient a *menstruum* to dissolve the *salts* which the *Ingredients* we use are full of, and it is in this *salt*, that their greatest *virtue* does consist.

Wherefore we ought to choose such *dissolvents*, as best preserve the virtue of *mixt* bodies, and such as are *familiar* to our nature. We must use *Spirit of wine* to extract *Rosines*, such as that of *Scammony*, *Galap*, *Turbith*; but whenever an *Extract* can be drawn with a watry *menstruum*, it is better to use that, rather than another, for the reasons I have mentioned.

Add to pag. 304. after the *chap.*

Of Gum Ammoniack.

C H A P.

Of Myrrhe.

MYRRHE is a *Gummy* juice that distils from a *Spinous Tree*, of a middle height, by *Incisions* that are made into it; this *Tree* grows commonly in *Ethiopia*, and *Arabia*, and because the *Inhabitants* of those countries are thought to feed on *Serpents*, the *Myrrhe* that is brought thence is called *Troglodytick*. The *Antients* were wont to collect from the same *Tree* a liquor that fell from it without *Incision*, which was called *Stacten*; 'tis only a *liquid Gum*, but I am apt to think it should have more virtue than common *Myrrhe*, because it was the more *spirituous* part, which filtrated through the *Pores* of the *Bark* of this *Tree*.

You

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You must choose such *Myrrhe* as is friable, light, odoriferous, clear, and such as is in small pieces, of a Yellowish colour, and bitter to the Taste; it is aperitive and resolute; it is much esteemed for *obstructions* of the *Uterus*, and to bring the *menstrua*, and to quicken Womens *Labour*; it also resists malignity of humors, it is used in *Corroborative Remedies*, and resolvent *Plaisters*.

Tincture of Myrrhe.

Put what quantity you please of good *Myrrhe* powdered, into a *Boulthead*, and pour upon it *spirit of wine* four fingers high; stir the matter and set it in *digestion* in warm *sand*, for two or three dayes, or until the *Spirit of Wine* is loaded with the *Tincture of Myrrhe*; then separate the liquors by *Inclination*, & keep it in a *Viol* well stopr. It may be used to expedite Womens *Labour*, to bring down the *Menstrua*, and in the *Palsy*, *Apoplexy*, *Lethargy*, and all diseases that proceed from *Corruption* of humors; it is *Sudorifick* and *Aperitive*: the *Dose* is from six drops to fifteen in some proper liquor: it is commonly used in outward applications, or mixed with the *Tincture of Aloes* to discuss cold *Tumors*, and to dissolve *Gypsons* humors by way of *Injection*, and for the *Gangrene*.

Remarks.

Though *Tinctures of Myrrhe* are daily drawn in *Wine*, or *Aqua vita*, notwithstanding the best

that can be Prepared is with Spirit of wine, because this *Menstruum* receives the more Oily, or Balsamick part of *Myrrhe*; whereas the *Phlegm* of Wine, and *Aqua vite*, do cause these liquors to dissolve, and impregnate with the more *terrestrious* part of the Gum, as well as with the Oily.

Some do use to evaporate this *Tincture* to the consistence of an *Extract*, but because thereby they are fain to lose the more *Volatile* part of the *Myrrhe* with the spirit of wine, I do conceive it better to use the *Tincture* it self as I have described it.

Oyl of Myrrhe per Deliquium.

Boil Eggs until they are grown hard, then cutting them in two, separate the Yelk, and fill the White with *Myrrhe* powdered, set them on little sticks placed conveniently on purpose, in a plate, or earthen pan, in a Cellar, or some such moist place, and there will distil a liquor to the bottom of the vessel, which you may take out, and keep for use. This is called the *Oyl of Myrrhe*: it is good to take away Freckles, and Tettars, applied outwardly.

Remarks.

Though this liquor, improperly called *Oyl*, is only the more soluble part of *Myrrhe* humected with the moisture of whites of Eggs, and the Cellar together, yet it is the best of any that have been

been invented, whether you draw it in *Spirit of wine*, or distil this *Gum* in a *Retort*; for by *spirit of wine* the more *Volatile* part of *Myrrhe* is lost, either by *Distillation*, or *Evaporation*; and it is so *Torrified* in a *Retort*, that it loses its best virtues; whereas *per Deliquium* what *Volatile* this *Gum* contains is preserved in its *Natural* being, for the humidities that mix with it are no ways capable of destroying or altering its nature.

Add to pag. 309. l. 11. in the Chap.

Of Vipers.

I am apt to conceive, that the *Venom* of *Vipers* is caused by an affluence of *Acid salts*, violently thrown forth, and which by insinuating into the *Veins*, do by degrees cause a *Coagulum* in the *Blond*, to hinder its *Circulation*, and the course of the *spirits*; this opinion is the more probable, in that *Coagulated Blond* has been found in the *Veins* of many *Animals*, which have been bit by the *Viper*, and besides the most powerful *Remedies* that cure this *Poison*, are *Volatile Alkali salts*, which are proper to dissolve the *Coagulum*.

As for what may be said, that if this discourse were true, the *Natural acidity* of the *Blond* would *Coagulate* it sometimes, as it happens to *Milk*, which *Curdles* of it self; and that this *Coagulation* would produce the same effects as does the *Venom* of *Vipers*; this *Objection* raises no difficulty at all. For the *Blond* circulating

in its *Natural* way, the *Acidity* that is in it is so well united to it, that it cannot separate to make a *Coagulum*, no more than the *acidity* that is in *milk* can separate from it, whilst the *milk* remains in the *Tears*, for we see it never ules to *Curdle* there, unless occasioned by some *Distemper*.

And again, who can doubt but certain *Pestilential* *Airs*, or divers *Diseases* that come from the corruption of the humours of the body, may be able to *Coagulate* the *Blond*, and have the same effect as the *venom* of *Vipers*?

Add to pag. 314. the bottom of the page in

IN Remarks on Distillation of Vipers.

There is another way of *Rectifying* the *Volatile salt*, which is by mixing it with five or six times as much *Bones*, or *Horns* burnt white, and putting the mixture into a glass, or earthen *Cucurbit*, then fitting to it a *blind head*, or such a one whose *Nose* has not been opened, after that luting well the *junctures*, then setting the vessel in *sand*, and with a gentle fire the *Volatile salt* will rise, and stick to the *head*, you must continue the fire until there rises nothing further.

This *salt* is hereby purified from a great deal of its *Oyl*, which remains in the powder of *Bones*, wherefore it is whiter than it was, and pleasanter to the *Palate*. It may again be mixt with other *Calcined Bones*, and sublimed as before, to render it the purer still, and take away the more of its unlaboury smell, that's caused partly by the *Em-*
pyrena-

pyreumatical oyl that it draws along with it in the distillation.

Add to pag. 316. the end of the same

Remarks.

If you distil two and thirty ounces of shavings of *Harts-horn*, you'll draw thirteen ounces of *liquor*, and *Volatile salt*, and there will remain in the *Retort* nineteen ounces of matter as black as any *Coal*.

You'll draw from the *liquor* an ounce and a half of *Volatile salt*, six ounces of *spirit*, and two ounces of *Black Oyl*.

The black matter being grinded on a *Marble* is good for *Painters* to use; if you *Calcine* it, the fuliginous parts which make it *black*, will fly away, and leave the *Hartshorn* very *white*; you'll have sixteen ounces of it, and this is called *burnt Hartshorn*. It is accounted *Cardiack*, but indeed has no other virtue than to destroy *Acids*, as all other *Alkali* matters do too.

Some do use to stratifie *Hartshorn* with *Bricks*, and *Calcining* it that way, they call it *Hartshorn* prepared *Philosophically*, they account it more *Cordial* than it was before; but they are very strangely mistaken, for the *Volatile salt*, and *Oyl*, which were the things that should render it *Cardiack*, were carried away in the *Calcination*, and there remains only a *Terrestrious* matter that might be called *Caput mortuum*. Notwithstanding it is an *Alkali*, that may serve as *Crabs-eyes*

eyes, Coral, and divers other matters of the like nature, which absorbe *Acids*; the *Bricks* bestow no virtue at all on it.

Add to pag. 323.

Remarks on the *Distillation of Wax.*

If by way of curiosity you desire to know exactly what quantity of liquor, or *spirit*, can be drawn from *Wax*, you must dry your *Bolus* as much as you can, or else use in its place, broken pots, or *Bricks* powdered, which are not at all wet: out of three and twenty ounces of *Wax*, you'll draw in the first *Distillation* just the same weight of liquor; to wit, twelve ounces of *Phlegmatick spirit*, and the rest is a *Butter*; in the second and third *Distillation* you'll draw fourteen ounces of *spirit*, and six ounces of clear *Oyl*.

Spirit of Wax is only a small quantity of *Acid Volatile salt* dissolved in *Phlegm*; but you must not believe what some have written, that having *Distilled* a considerable quantity of *Wax*, and put that which was drawn into a *Boulthead* with a long neck, they could *sublime* the *Volatile salt* like others of that nature. For this *salt*, though it is indeed *Volatile*, yet it is not *Volatile* enough to rise before the *Phlegm*; it is an *Acid salt* much like unto that of *Amber*, but is not of the nature of *Volatile Alkali's*, which are known to *sublime* so easily; it were better therefore to keep this *spirit* as it is, or else to evaporate about half of it

it with a very mild heat, that it may be the stronger.

The *Volatile salts* of many *sulphureous* matters are drawn *Acid*, as they were *de facto* in the *mixt*, because being cloathed with *soft* and *rag-mous* parts which give way easily to their motion, they do not break their natural keenness in endeavouring to separate, when they are forced by fire, and so they do not receive so much *terrestrious* and *fiery* matter, as is requisite to make them *Porous*, like *Volatile Alkali's*.

Methinks this *Operation*, and the *Distillation* of *Amber* which I have described, do much confirm what I said before in my *Remarks* upon the *Principles*, that all the *salt* of *mixt* bodies is naturally *Acid*, and that *Alkali* is nothing else but a *mutation made by fire*. Besides, all sorts of *Experiments* do seem to me to confirm and establish this *Opinion*; but yet I am not so peremptory in the vindication of it, but would gladly give place to another, if I could be shewed that it is better than mine, for I seek after nothing else but real *Truth*.

Neither would I have it thought, I am so full of *Vanity*, as to vaunt my self for the *first Author* of this *Opinion*, of many other thoughts, and of all the wayes of *Operation* that are to be found in my *Book*, as if for certain they were never writ before; for although I can assure my *Reader*, that they are dictates of my own conception, and that I have not searched into any *Author* whatsoever to find them out; it may have hapned nevertheless, and I am willing to think

think so, that many others besides my self may have thought and written the same things that I have done, and with *more order* and *decorum*. All the *glory* therefore that I am desirous to reserve unto my self, upon this occasion, is, that I have had the fortune to fall into the same reflexions, as many *Ingenious* persons have done before me, without *consulting* any of them.

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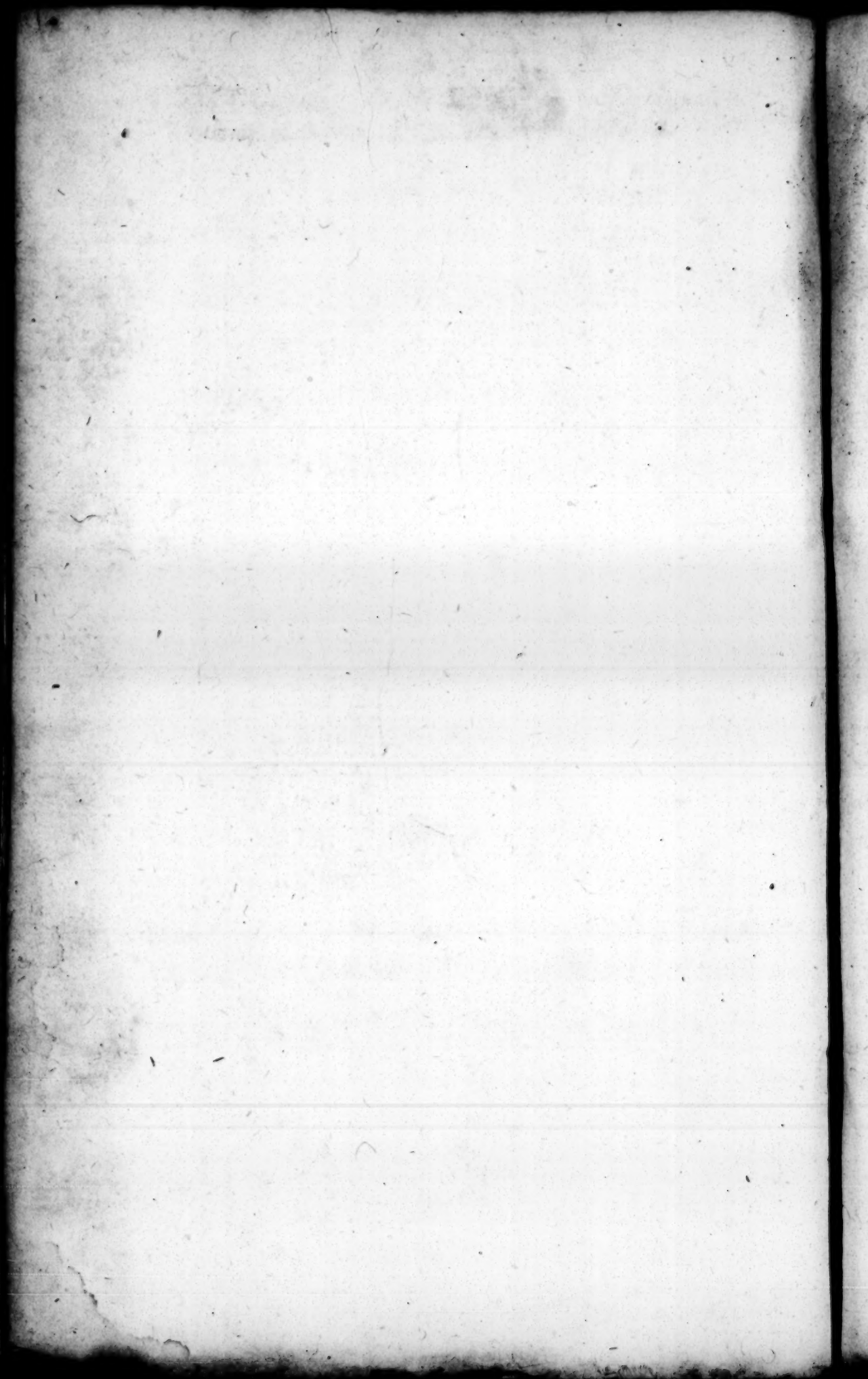
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